

Clearbrook Waterworks District 2023 Water Quality Report



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Cover image: Reservoir C – the photograph was taken from inside the reservoir (*Reservoir C Rehabilitation Project*); image courtesy: James Wiens.

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Foreword

Clearbrook Waterworks District (CWD) proudly presents the 2023 Water Quality Report to our stakeholders in order to provide a clear and complete accounting of water quality, including a full spectrum analysis of the makeup of our water. Please read on to learn more, including updates about our water system, plans to upgrade infrastructure, and clear documentation outlining the ongoing commitment of the CWD Board of Trustees and staff to maintain and deliver our high-quality, award-winning H₂O.

This report, published annually, is prepared for the stakeholders and required by the provincial health legislation (Drinking Water Protection Act). The report has been prepared in collaboration with Dr. Ineke Kalwij, of Kalwij Water Dynamics Inc. (KWD). The report includes contributions from James Wiens (CWP), CWD Field Supervisor and Ryan Federau (CWP), the District's Water Quality Technician.

CWD remains in compliance with all provincial and federal regulations relating to the supply and delivery of potable water, at all times. To that end, we maintain a close and collaborative relationship with Fraser Health Authority, and we value their feedback. We remain committed to the protection of public health through the uninterrupted supply of safe and clean drinking water to our ratepayers.

Our highly trained water system operators are certified through the Environmental Operators Certification Program, where constant education and training are necessary to maintain a valid certification. Our operators are skilled, diligent, and dedicated to maintaining and improving the system. CWD employs three Level II Water Distribution System Operators, a Level I Operator and our newest employee is an Operator-in-Training.

Maintaining our high standard of water quality requires a comprehensive program, utilizing proactive maintenance schedules, consistent asset management, adoption of emerging technologies, and best engineering practices. Our operators work closely with our engineering consultants to ensure all aspects of the system are designed, installed, and maintained in order to maximize the lifespan of our assets. We employ a multitude of security measures and checks to ensure the system remains safe from intrusion or contamination and our expectation is that water quality remains consistent from source to tap. We at CWD also recognize the importance of due diligence and care when it comes to managing and maintaining our production wells and our most important natural asset; the Abbotsford-Sumas Aquifer.

With the future of the system in mind, we continue to make capital upgrades to the system, which includes the continuation of a main upgrade project in the Royal Street area. The project will see almost 250 meters of aging watermain replaced with larger, more resilient pipe. This project will be completed by our own field crew.

At CWD, our stated mission is to provide superior water in sufficient quantity to the residents and businesses of the District and to ensure long-term sustainability of product and service. To that end, we believe people are CWD's most valuable asset and water is its greatest resource. We

remain committed to looking after the former and safeguarding the latter. Please accept my warmest thank you, on behalf of the District's Board of Trustees and staff, for your support and interest in the operations of the District. Please read on to learn more about the water quality of your award-winning system.

Respectfully submitted,

Jason Hildebrandt, CWP
Corporate Administrator

Units and Abbreviations

Units

Billion Litres	BL
Cubic metres	m ³
Hour(s)	hr(s)
Inch	in
Kilometres	km
Litres per second	L/s
Litres per capital per day	L/c/d
Metres	m
Millimetres	mm
Million Litres	ML
Million cubic metres	Mm ³
Milligrams per litre	mg/L
Minute	min
Percent	%
US gallons per minute	US gpm

Abbreviations

Advanced Metering Infrastructure	AMI
Aesthetic Objective	AO
Bacteriological Activity Reaction Test	BART
BC Water and Waste Association	BCWWA
Clearbrook Waterworks District	CWD
Environmental Operators Certificate Program	EOCP
Fraser Health Authority	FHA
Heterotrophic Aerobic Bacteria	HAB
Iron Related Bacteria	IRB
Maximum Acceptable Concentration	MAC
Ministry of Water, Land and Resource Stewardship	WLRS
Most Probable Number	MPN
Nephelometric Turbidity Units	NTU
Slime Forming Bacteria	SLYM
Sulphate Reducing Bacteria	SRB
Supervisory Control and Data Acquisition	SCADA

1. Introduction

The **2023 Annual Water Quality Report** has been prepared for our rate payers and Fraser Health Authority (FHA) and summarizes pertinent water system and water quality information of Clearbrook Waterworks District (CWD). Since 1954, CWD provides potable water and fire flow protection to the area formerly known as “Clearbrook”, located within the City of Abbotsford. The water system is supplied, through four production wells, by groundwater from the Abbotsford-Sumas Aquifer. CWD’s office and works yard is located at 2889 Grandview Crescent (the reservoir site).

As per regulatory requirements, under the **Drinking Water Protection Act**¹ and **Drinking Water Protection Regulation**², water purveyors are required to monitor the quality of water supply source(s), the water in the distribution system, and the water supplied to the end users. CWD is working in close collaboration with the FHA drinking water officers to always ensure safe drinking water. A message from the Manager of Fraser Health Drinking Water Program, dated March 3, 2023, regarding metals in drinking water (“*Flush Message*”) is included as **Appendix A**. **Appendix B** includes information about preventing water-borne infections for people with weakened immune systems.

CWD’s website (www.clearbrookwaterworks.com) provides information for the rate payers regarding: (i) the water system & history; (ii) water rates and (e-)billing; (iii) bylaws; (iv) selected documents (water quality reports, water system map, leak relief request forms), and (v) the schedule of Board meetings and Annual General Meeting. Rate payers may also submit water meter readings through an online portal on the website.



IMAGE | CWD’S OFFICE & WORKS YARD (RESERVOIR SITE) AT 2889 GRANDVIEW CRESCENT.

¹https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/01009_01.

²https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/200_2003.

2. Water System Overview

2.1 The Water System

CWD's water system provides potable water to residential dwellings and commercial buildings (**1,417 connections** as of the end of 2023), serving an estimated population of about 10,399 people³. The water system also provides water for fire flow requirements, and CWD is responsible for installing and maintaining the fire hydrants. The water system is fully metered. CWD is in the process of installing Advanced Metering Infrastructure (AMI) through the entire water system, scheduled for completion in 2024.

A combined length of an approximated 33 km of water mains distributes the water through the district. Water is distributed directly from the source (production wells) and from the reservoirs. The watermain pipe sizes vary between 150-mm (6-in) and 400-mm (16-in). The reservoirs have a combined storage of 9,050 m³.



IMAGE | WATER INFRASTRUCTURE AT THE RESERVOIR SITE.

³ Population estimates as of Dec. 31, 2022 (a 1.3% annual growth rate is assumed), does not include “in transit population”.



IMAGE | THE RESERVOIRS WITH COMBINED STORAGE OF 9,050 M³

2.2 CWD's Operators

CWD's operators are all EOCP-certified⁴ Water Distribution System Operators Level 1 (2 operators in 2023) and Level 2 (three operators). Early 2024 one Level 1 operator moved to interior of the province and recently, an Operator-in-Training has joined CWD. All operators are cross trained in various aspects of the water system operation and maintenance.



IMAGE |FROM LEFT TO RIGHT: Jason Hildebrandt (Corporate Administrator, WDSO II), Cole O'Malley (WDSO I) – left early 2024, James Wiens (Field Supervisor, WDSO II), Ryan Federau (Water Quality Technician, WDSO II), and Ryan Allen (WDSO I). In 2024, Craig Desnoyers joined CWD as operator-in-training.

⁴ Environmental Operators Certificate Program; for more information: <http://eocp.ca>.

2.3 Our Production Wells

The water system relies on four production wells for water supply, located at our Lynden and Autumn Well Fields at Lynden Street and Autumn Avenue, respectively. The production wells were constructed under CWD's Well Replacement Program (2010-2017) and have replaced aging well infrastructure. To ensure longevity and productivity of the wells, CWD implements a preventative well maintenance program with entails the routinely assessment, inspection and cleaning of the wells.

There are two production wells at each well field:

- 💧 RW 3-93/11 – in operation since 2011 (Lynden Well Field).
- 💧 RW 7-00/13 – in operation since 2013 (Lynden Well Field).
- 💧 RW 1-87/14 – in operation since 2014 (Autumn Well Field).
- 💧 RW 2-63/17 – in operation since 2017 (Autumn Well Field).

The production wells are equipped with a submersible pump and motor with a nominal discharge rate of 50 L/s. The wells operate in rotation (between well fields and wells). The combined yield of the production wells is sufficient to meet current and future water demand.

2.4 SCADA

The Supervisory Control and Data Acquisition (SCADA) system CWD has in place is integral to CWD's operation and monitoring of the water system and our natural asset (i.e.: the aquifer). Through SCADA, CWD has real-time access to pertinent operation and monitoring aspects of the water system. Monitoring includes continuous data recording of flow information, water levels in wells, reservoir levels, water system pressure, and water temperature (reservoirs and wells). SCADA data analysis, completed by our hydrogeologist, provides essential information of our supply and distribution system. Also, through SCADA, alarm features are enabled, and CWD's system operators are notified instantaneously (through their hand-held devices) in case there is a problem with the system's operation or in case of unauthorized access.

2.5 Emergency Response Planning

CWD has a comprehensive Emergency Response Plan in place, approved by FHA. Furthermore, at each pump house (Lynden and Autumn well fields), fully functioning emergency chlorinators are installed. These chlorinators are solely used in the event of a water quality related emergency. CWD is also equipped with emergency water supply provisions, which will enable us to set up temporary mobile water supply stations in the event of an emergency. The idea is that no one should have to walk more than 500 metres to get access to potable water in the event of water system failure due to a catastrophic event.



IMAGE | AUTUMN WELL FIELD: PUMP HOUSE AND RW 1-87/14

2.6 Community Outreach

CWD organizes open houses on an annual basis, typically held during summer. CWD started with this event as an opportunity for our stakeholders to informally meet with CWD staff and Board Members, and to learn more about the water system and groundwater. At the same time, vendors and consultants CWD works with are invited showcase latest technology and educational material.

In 2023, for CWD organized the **Open House** in conjunction with the **Annual General Meeting**, held at the **Reservoir Site** (2889 Grandview Crescent) on June 16, 2023.



IMAGE | ROYAL STREET WATER MAIN LOOP PROJECT, COMPLETED IN-HOUSE.



IMAGE | ROYAL STREET WATER MAIN LOOP PROJECT, COMPLETED IN-HOUSE.

3. Water Supply Source Monitoring

3.1 Our Aquifer

CWD's production wells extract water from the Abbotsford-Sumas Aquifer (**Figure 1**). This trans-boundary aquifer covers an area of approximately 161 km² and extends from the Fraser Valley into Whatcom County of Washington State, USA. It is an unconsolidated aquifer composed of sands and gravels (glacial outwash deposits). Although the aquifer is classified as an unconfined aquifer, some parts of the aquifer are confined. CWD production wells screen the aquifer at a location characterized by an overlaying confining layer. This confining layer of low permeability consists of silt and clay (also termed an *aquitard*). The presence of such *aquitard* is advantageous from an aquifer protection point of view as the aquitard forms a barrier to possible contamination introduced at the ground surface.

The aquifer is considered high-productive. The City of Abbotsford, CWD, and Fraser Valley Trout Hatchery are the major commercial groundwater users (of the Canadian portion of the aquifer). Furthermore, agriculture relies on the aquifer for water supply. There are also a considerable number of domestic water supply wells extracting water from this aquifer. The Government of B.C. classifies the Abbotsford-Sumas Aquifer as a heavily developed and highly vulnerable aquifer. CWD has a wellhead and aquifer protection program in place to safeguard the groundwater resource.

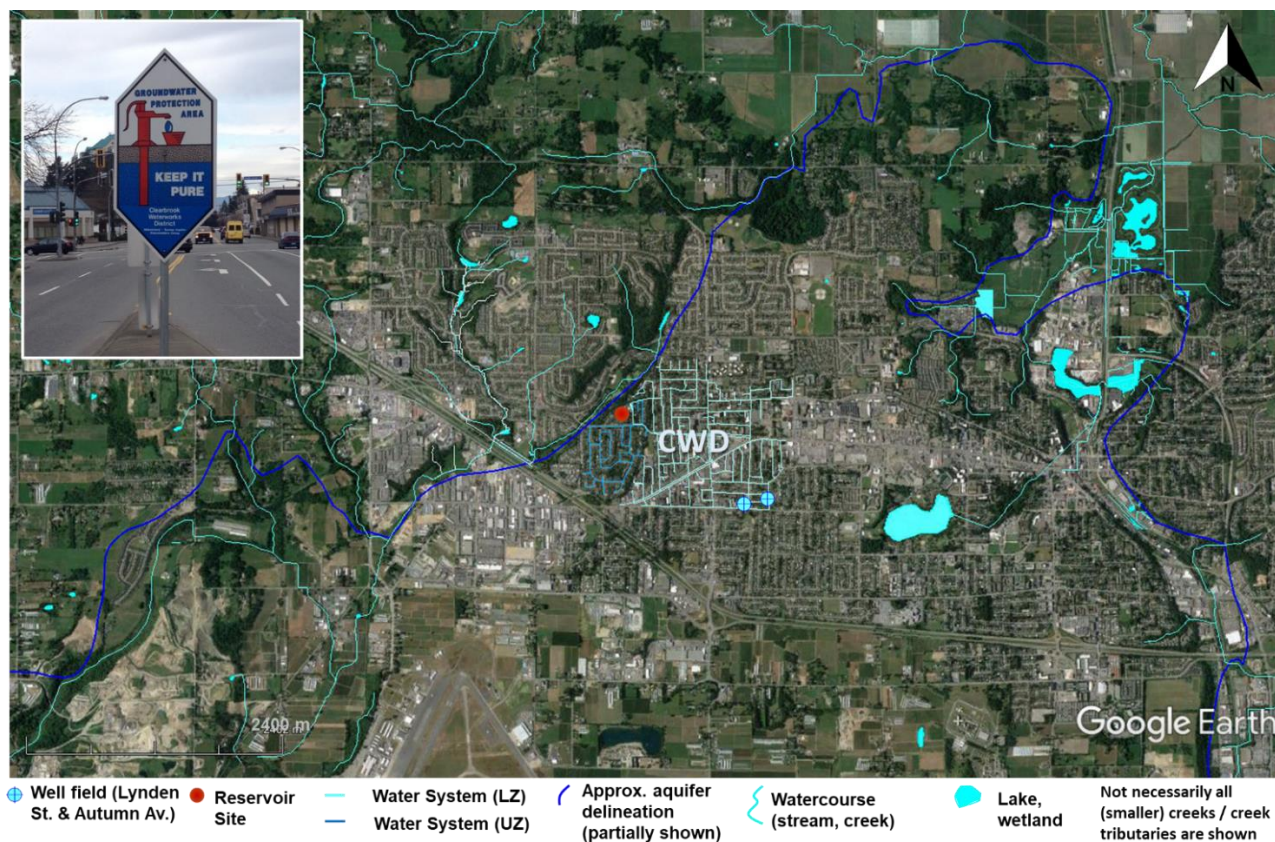


FIGURE 1 - PARTIAL DELINEATION OF THE ABBOTSFORD-SUMAS AQUIFER AND CWD'S WATER SYSTEM. INSET (PHOTOGRAPH): CLEARBROOK WATERWORKS DISTRICT IS A DESIGNATED GROUNDWATER PROJECTION AREA.

Regarding Groundwater Licensing:

As required under the Provincial *Water Sustainability Act* (WSA)⁵ and *Water Sustainability Regulation*⁶ CWD has applied for an existing groundwater use license (submitted early 2017). The groundwater licence application is being processed by the Ministry of Water, Land, and Resource Stewardship (WLRD). WLRD is responsible for issuing water authorizations.

3.2 Groundwater Monitoring

CWD has a comprehensive wells and groundwater monitoring program in place for many years. Under this program, among other, collected data (recorded through SCADA) is analyzed to provide a meaningful interpretation of various data, some of which presented in this report.

2023 Groundwater Withdrawal

CWD's production wells have been successfully operating in rotation throughout 2023. RW 2-63/17 was placed off-line early September because of pump failure (*the pumping system was removed in November and pump replacement was delayed to February 2024 due to the pump delivery time from the manufacturer*). **Figure 2** shows the monthly groundwater withdrawal for 2023. The figure shows the monthly volumetric contribution of each well. The total height of each bar reflects combined monthly groundwater withdrawal volume, also indicated by the red circular markers. For comparison purposes, the figure also shows total monthly groundwater withdrawal volumes of 2023 data (shown as white circular markers). (The lines which connect markers in the figure have no meaning.)

Monthly water use exceeded 100,000 m³ in July and August (and was close to 100,000 m³ in May). The combined summer withdrawal (May - September) was very similar to 2022 summer withdrawal: 507,467 m³ and 513,956 m³, for 2022 and 2023, respectively (*i.e.*, a 1.28 % increase); annual groundwater withdrawal increased by 1.74 %, compared to 2022.

2023 Groundwater Withdrawal Information and Related Statistics

-
- The annual total volume of combined withdrawal is 1,125,825 m³ (1.13 BL).
 - Combined average monthly withdrawal volume is 93,819 m³ (93.8 ML).
 - The combined average daily withdrawal volume is 3,084 m³ (3.08 ML).
 - The average instantaneous discharge rate of the wells is 48.7 L/s (175 m³/hr).
 - The combined annual hours of well operation are 6,422 hrs (17.5 hrs per day)
 - The combined annual energy cost for extracting water is \$45,356 (4.0 ¢ per m³)
-

⁵ <http://www.bclaws.ca/civix/document/id/complete/statreg/14015>

⁶ http://www.bclaws.ca/civix/document/id/complete/statreg/36_2016

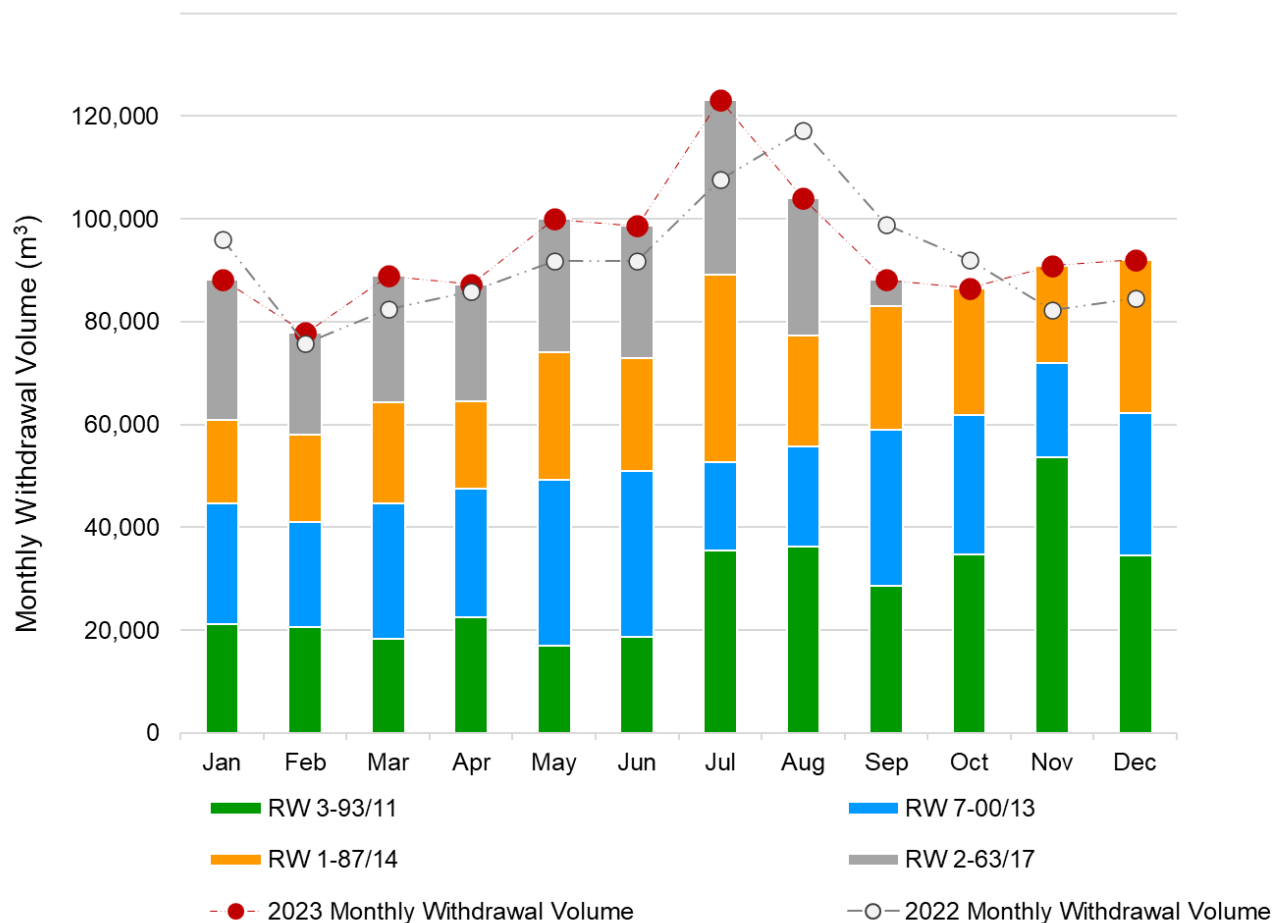


FIGURE 2 - MONTHLY GROUNDWATER WITHDRAWAL VOLUMES (2023); ALSO INCLUDED 2022 MONTHLY DATA.

Groundwater levels

CWD has a designated groundwater monitoring well, MW 6-59, at Lynden well field, connected to SCADA for continuous real-time recording of groundwater levels. The groundwater level (elevation) trend, shown in **Figure 3** (for years 2018 to 2023), provides valuable insight in the variation in groundwater levels seasonally, and between years, as observed at the designated monitoring well and representative for the local groundwater level. This is essential information for safeguarding the sustainability of the aquifer.

The sine-shaped data series illustrate seasonal variation in groundwater levels within a year and between years. The observed trend suggest:

- periods of (seasonal) **groundwater recharge** during which groundwater levels rise during **fall and spring** (of the following year), indicated by the **upwards blue arrow** in the figure; and
- periods of seasonal groundwater level decline (**groundwater discharge**) which occurs every year from spring to fall, indicated by the **downwards blue arrow** in the figure.

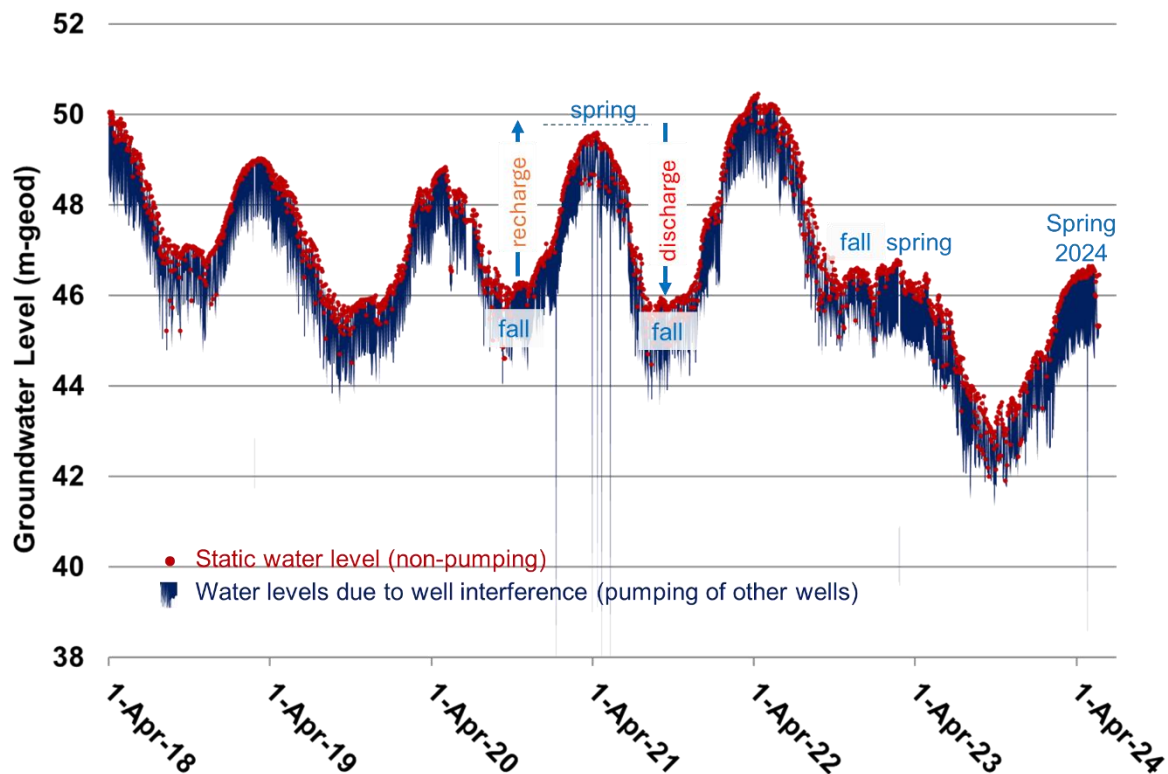


FIGURE 3 - GROUNDWATER LEVEL TRENDS OBSERVED AT CWD MW 6-59 (JAN. 1, 2018- MAY 22, 2024).

The seasonal recharge, as observed at MW 6-59, during the 2022-2023 winter season was unprecedented low: 0.62 m (in amplitude) which is the lowest on record (since 2008). This is 79.4% less than the average seasonal recharge of 3.03 m based on 2010 – 2022 data (for MW 6-59). The 2023-2024 recharge was 3.76 m (higher than the average seasonal recharge), but insufficient to make of for the recharge shortfall observed during the 2022/2023 season.

The historical low groundwater level observed in 2023 is concerning, but, at this point, we do not know if this trend will continue. Water demand is typically the highest during the summer months (especially during periods of hot and dry weather conditions). Therefore, water conservation is essential to reduce the stress on the aquifer. CWD will continue closely monitoring the groundwater level trend.



IMAGE | RW 1-87/14 WELLHEAD COVER.

4. Selected Work and Projects

4.1 Work and Projects completed in 2023

Water System Maintenance

Water system maintenance is on-going throughout the year. The following is a list of selected maintenance work (and related task) completed in 2023:

General

- ✓ 292+ work orders were completed; 223 BC#1 calls were marked out; and 9 emergencies after hour callouts were responded to.
- ✓ 48 hours shutoff notices were hand-delivered throughout the year.
- ✓ Cross Connection Control - mailing out letters requiring businesses to have their devices tested and the results sent to BSI (<https://bsionline.ca/>); businesses that do not comply to this may face the risk of having their water connection turned off by CWD.

Hydrants

- ✓ 87 fire hydrants were flushed.
- ✓ Hydrant maintenance was completed on all of our Canada Valve, Mueller and Clow hydrants.
- ✓ 6 hydrants were painted to show their correct flow rate.

Water meters

- ✓ Meter reading was completed quarterly in 2023. After each reading cycle high and low readings were investigated.
- ✓ One water meter was removed and repaired in-house after the meter stopped registering flow.

Service lines

- ✓ 22 new 2.54 mm (1 inch) service lines were installed.
- ✓ A service line leak was repaired at 31425 Springhill Place.
- ✓ A service line leak was also repaired at 31806 Coral Avenue.

Water main repair

- ✓ A water main break was repaired at 2692 Clearbrook Road.
- ✓ A water main break was repaired at 2991 Trethewey Street.

General maintenance

- ✓ Month end duties were completed at the end of each month. These duties include running the site backup generators, plus running all 4 of our mobile generators, checking all the vehicles and reviewing a tool list for each vehicle.
- ✓ Equipment maintenance was done in January on all of our equipment as well as any required maintenance throughout the year.
- ✓ The batteries were replaced in all of the emergency exit signs at the works facility.
- ✓ The annual inventory was completed in December.

- ✓ The stainless-steel standpipes at the well fields were manually drained as well as hydrant C10 prior to the freezing temperatures. The drinking fountain at Spud Murphy Park is also taken offline during the freezing months.



IMAGE | WATER SYSTEM FLUSHING IN PROGRESS.

Reservoir Site, Pump Stations and Well Fields (General)

- ✓ Pacific Gen Care Ltd. (Abbotsford) serviced all three of CWD's backup generators.
- ✓ Fire Valley Fire Protection tested all the fire alarms at all the sites.
- ✓ General maintaining of the lawns and hedges.
- ✓ The block heater of the reservoir site generator was relaced by field staff.
- ✓ Repairs to the main gate to the reservoir site and office.
- ✓ Instrumentation checks were completed for the pressure transmitters installed in the production wells.
- ✓ Pump speed tests were completed for all four production wells.
- ✓ A new Human Machine Interface (HMI) screen was installed at the Control Pannel at Lynden Pump House.

Reservoir C Rehabilitation

Reservoir C rehabilitation, completed in-house, dealt with improvement to the overflow pipe in the reservoir. After a closer inspection it was determined that the buildup (iron precipitate) on the existing pipe could be cleaned. After the cleaning, the pipe was finished with a 2-part epoxy coating.

Reservoir C was drained in preparation for the overflow pipe rehabilitation work. Also, prior to the work, a Confined Space entry procedure was created as well as a hazard assessment was completed. Prior

to the work, the *Davit arm* on top of Reservoir C was removed and painted with a galvanizing paint. Afterwards it was installed as per an engineer's design.

A contractor was hired to install and remove the scaffolding inside of the reservoir and a crane was hired to lift materials from the ground to the top of the reservoir as well as to stand by with a man basket at all times we had employees working within the reservoir in case of an emergency.

Wire wheel brushes were used to remove the iron precipitate buildup on the steel pipe. The 3 brackets were replaced with new stainless-steel brackets. Two (2) coats of 2-part epoxy were applied 10 days apart from each other. Furthermore, a mechanical mixer was installed in the reservoir to ensure a better mixing of the older and newer water that enters the reservoir.

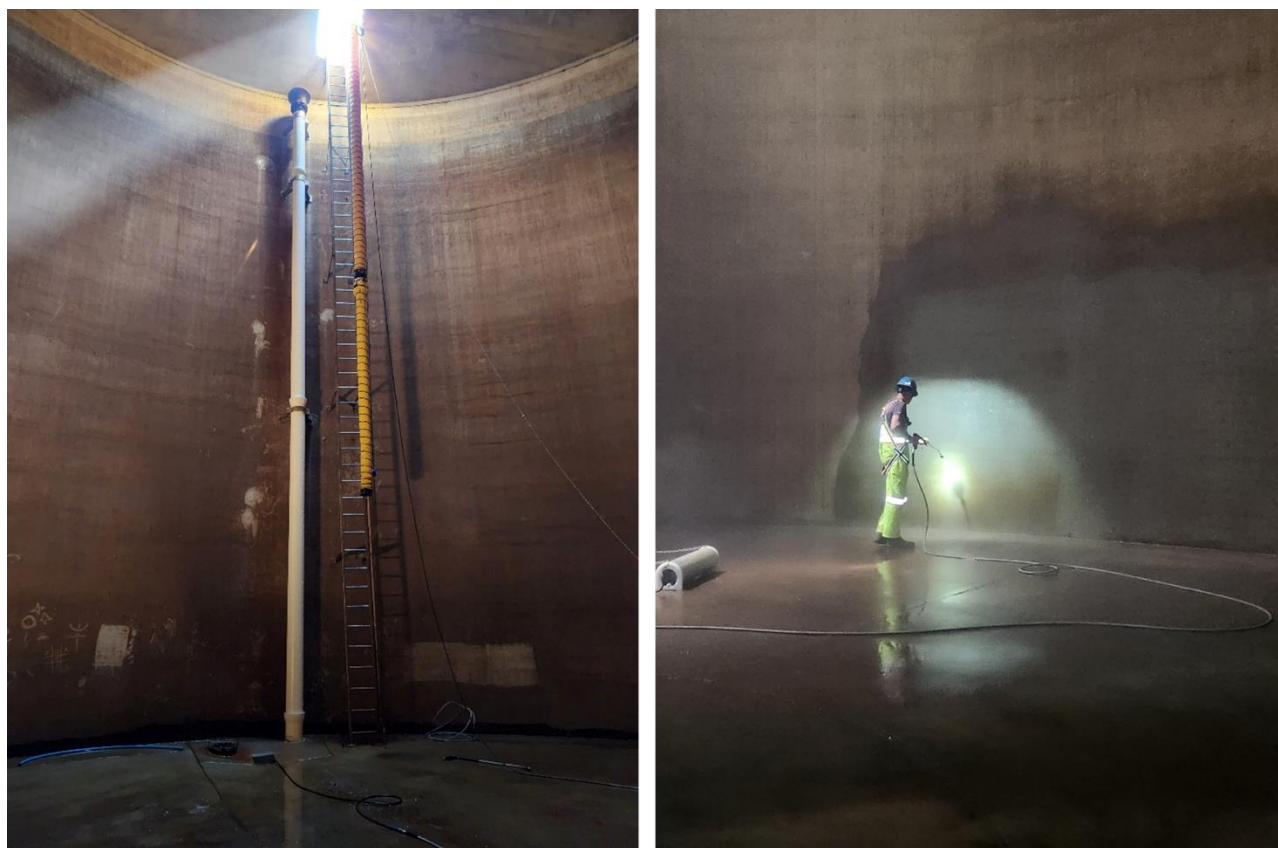


IMAGE | LEFT: CLEANED OVERFLOW PIPE; RIGHT: PRESSURE WASHING THE INSIDE OF THE RESERVOIR.

After the reservoir C rehabilitation was completed, the field crew pressure washed the inside of the reservoir. The reservoir was then filled with water and drained to rinse the entire tank before it was again filled, this time with chlorinated water. The reservoir was then drained and de-chlorinated at a controlled discharge rate before being filled again and tested for water quality. After all testing came back clear the reservoir was put back in operation.



IMAGE | LEFT: ORIGINAL BRACKER; RIGHT: NEWLY INSTALLED STEENLESS-STEEL BRACKET.



IMAGE | SPECIALY GEAR NEEDED TO SAFELY DECENT AND UNDERTAKE WORK IN THE RESERVOIR.

Water Main Construction – Pipe Replacement Program (2023 Capital Project)

Phase 2 Royal Street Loop – completed in-house. This included 235 metres of 250-mm (10-inch) C909 pipe (Bionax® PVCO Pipe), replacing 150 mm (6 inch) and 200 mm (8 inch) AC pipe. Included in this project was the upgrading of 13, $\frac{3}{4}$ services to 2.54 mm (1 inch). An old TC1 slide gate hydrant was replaced with a H105/C71P hydrant. The entire project was paved afterwards with a 3-meter-wide patch.



IMAGE | ROYAL ST. LOOP PROJECT – LEFT: SERVICE LINE CONNECTION; RIGHT: 250-MM BIONAX® PIPE.

Work Pertaining to New Developments

- 22 Capital Expenditure Charges (CEC) were completed.
- 12 fire flow tests were completed for potential future developments and lot split developments.
- Review of proposed development design drawings throughout the year. All development drawings are approved by CWD's corporate administrator, Jason Hildebrandt, and Field Supervisor (James Wiens) before they can receive final approval.
- Completion of daily site inspections pertaining to water main installation work for the 32174 George Ferguson Way Development.

Advanced Metering Infrastructure (AMI) Replacement Program (2023 Capital Project)

- About 158 meters were replaced.

Water Quality Monitoring

This is an on-going activity and is addressed in **Section 5** ([Water Quality Assurance](#)) and **Section 6** ([Water Quality Review](#)).



IMAGE | INSIDE THE PUMP HOUSE SHOWING THE WATER MANIFOLD WITH SAMPLE STATION.

Groundwater Monitoring & Well Assessments

Pertinent information is recorded through SCADA pertaining to the operations of the wells, groundwater levels and temperature and reservoir operation. In addition to the automatic recording of data through SCADA, field staff completes daily pump checks and manual groundwater readings on a bi-weekly basis for selected monitoring well locations. CWD also monitors sand intake (by the pumps) by means of a sand tester connected to the water manifold.

Furthermore, under the guidance of KWD various tests are completed on the production wells pertaining to well hydraulic performance and pump / motor performance. Step-drawdown pumping tests (for assessing well hydraulic performance) and pump speed tests (submersible pump / motor performance) were completed for all four production wells.

These tests allow for a better understanding of possible changes in well and pumping system performance of time. This information is relevant to the timely scheduling of well maintenance (well rehabilitation) and replacement of the submersible pump and / or motor.



IMAGE | WATER LEVELS ARE TAKEN BY CWD STAFF DURING A STEP-DRAWDOWN PUMPING TEST.

RW 1-87/14 Preventative Well Maintenance

CWD has a comprehensive well maintenance program in place which entails the implementation of preventative well rehabilitation every 4 to 5 years for each production well (on a rotational basis). During such well rehabilitation specific measures are employed to 'clean' the well of any accumulated materials (e.g., mineral deposits and biomass) which causes clogging of the well screen openings (slots) which may impact well performance. Goals of a consistent and timely implementation of the preventative well maintenance program are to ensure the wells' productivity and longevity.

RW 1-87/14, located at Autumn Well Field was constructed in 2014, and placed online on November 14, 2014. The first preventative maintenance for this well was completed in December 2019, and the second preventative maintenance was completed in the week of November 20, 2023. The well rehabilitation was completed by Fyfe Well & Water Service.

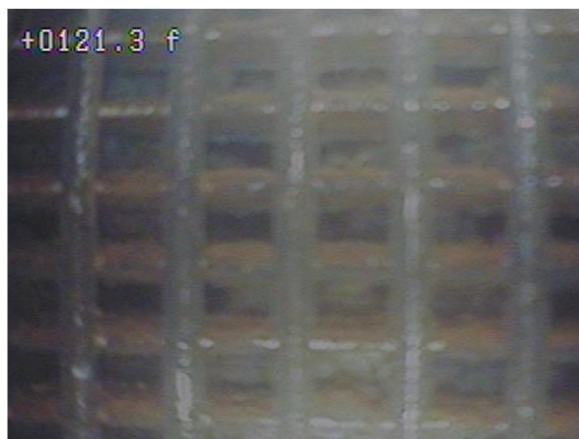
As of November 21, 2023 (start of the preventative well maintenance), **RW 1-87/14**:

- ◆ Has been in operation for **9.02** years (i.e.: 9 years and 3 weeks).
- ◆ Has been pumping for **15,056 hrs.**
- ◆ Has withdrawn a water volume of **2,646,378. m³**.
- ◆ Has been operating at an average instantaneous discharge rate of **48.8 L/s (176 m³/hr)**.
- ◆ Has been contributing on average **22.5%** of the water supply (2014-2023).

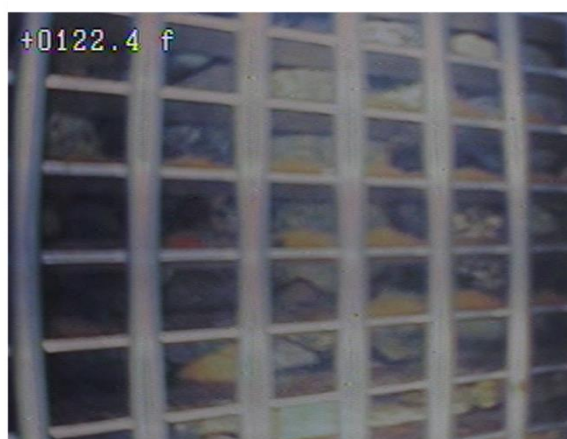
The well rehabilitation program included:

- ✓ Downhole video inspections before and after the rehabilitative efforts.
- ✓ Mechanical cleaning (brushing).
- ✓ Chemical rehabilitation (application of acid descaler).
- ✓ Flushing / removal of dissolved incrustations.
- ✓ Inspection of the pumping equipment.

The preventative maintenance for RW 1-87/14 has been successfully implemented. The implemented well rehabilitation protocol *was effective in removing most of the observed incrustations (precipitated iron and manganese).*



Before chemical treatment (shows scaling on the screen slots and vertical rods)



After chemical treatment (most scaling has been removed)

IMAGE | EXCERPTS FROM THE DOWNHOLE VIDEO INSPECTION – THE VIDEO IS DIRECTED TOWARDS THE WELL SCREEN AND GEOLOGICAL FORMATION.



IMAGE | LEFT: THE DOWNHOLE VIDEO INSPECTION CAMERA; RIGHT: A SPECIAL WELL BRUSH USED FOR MECHANICAL AGITATION OF THE INTERIOR SURFACES OF THE WELL, PRIMARILY TARGETING THE SCREENED SECTION

4.2 Training

Staff attended courses and conferences to stay current on knowledge and certification. One operator completed a cross-connection control course offered by the BC Water and Waste Association (BCWWA). All field crew completed a confined space entry course (prior to the Reservoir C rehabilitation work). Field crew also attend the Fall Arrest training. Staff attended the BC Water and BCWWA Annual Conference and Tradeshow in Penticton and the EOCP Annual Conference in Vancouver. Staff attended an introductory course on hydrogeology and groundwater management taught by Ineke Kalwij (KWD). Staff also attended the training on distribution system best practices and control Valve operation and maintenance (offered by the BCWWA).

Furthermore, all CWD staff received a 2-day training on *Asset Essential*, a cloud-based software that manages maintenance service requests and its progress. This software replaces *Mobile 311* which CWD has been using for 7 years. CWD decided to change to *Asset Essential* because *Mobile311* was discontinued.

4.3 Schedule Work for 2024

The following projects are scheduled for 2024:

Flushing Program

- ❖ Uni-Directional Flushing (was completed in February).
- ❖ Regular flushing is scheduled for fall.

Pipe Replacement & Upgrade Program

- ❖ Along Conrad Avenue and Carla Court. The Conrad Avenue section entails replacing 150 mm AC with 250 mm C909 (Bionax®), and Carla Court section entails replacing 100 mm AC with 200 mm C909.

Reservoir Site

- ❖ Installation of an emergency bypass line from Reservoir B, directly to the distribution water main, and thus bypassing the Reservoir B kiosk and pump station.

AMI Meter Replacement (Capital Project)

- ❖ The project started in 2021 and continued in 2022; in 2023 the plan is to have all meters replaced by AMI meters (about 500 meters).

Water Main Construction Oversight

- ❖ Oversight of contractor retained by CWD to install watermain sections along Clearbrook Road at three different locations.

Preventative Well Maintenance Program

- ❖ Preventative maintenance for **RW 3-93/11** is scheduled for this year. This will be the third well rehabilitation since being commissioned in 2011; the second well rehabilitation was completed in 2020.

Furthermore:

- ❖ Hydrant painting and labelling is planned and completion of inventory (yard and office).
- ❖ Residential service upgrades; between 12 to 24 service lines.

5. Water Quality Assurance

5.1 Water Quality Monitoring

Providing safe, reliable, and clean water to our rate payers remains CWD's key responsibility. We take pride in providing drinking water of the highest quality at a reasonable cost, thereby meeting water demand, complying with provincial regulations, and working responsibly to protect our aquifer.

According to **Section 15 (b) of the Drinking Water Protection Act**, a water supplier must make available to the public the results of the water quality monitoring, and, **in accordance with Section 11 of the Drinking Water Protection Regulation**⁷, that this is done within 6 months of the end of the calendar year.

The Drinking Water Protection Regulation sets water quality standards for potable water (selected microbiological constituents in drinking water). The Drinking Water Act and Regulation are enforced for community water systems in British Columbia⁸.

Therefore, as a water purveyor, we are required to have our water analyzed to confirm the absence of selected microbiological parameters by an accredited laboratory. This entails routinely (weekly) monitoring of our water supply and distribution system: CWD has 20 water sampling locations throughout the District, in addition to our four (4) production wells and two (2) reservoirs, which, on a rotating basis, are sampled and analyzed for microbiological parameters: *Total Coliforms* and *Escherichia coli* (*E. coli*).

The results of the 2023 microbiological water quality samples submitted to the BC Center for Disease Control (BCCDC) by FHA are included as **Appendix C**. The reports shows that **228 water samples** were analyzed: *216 samples are from designated sample stations and the 2 reservoirs; and 12 samples are from the production wells*. Results suggest that 94.74% showed absence of the tested microbiological parameters (Total Coliforms and *Escherichia coli*). Only 12 water samples tested positive for Total Coliform, and there was only one instance that there was a consecutive sample that contained total coliform (32171 South Fraser Way – Petro Canada). All samples tested negative for *E.coli*.

Furthermore, on January 5, July 7 and December 20, 2023, CWD collected water samples from the source (i.e.: the production wells), from the reservoirs and two sample stations in the District⁹. The water samples were submitted to an accredited water testing laboratory (Element, located in Surrey) for potability analysis (**Section 6**). On July 18, 2023, water samples were collected from RW 2-63/17 for a comprehensive water quality analysis, further discussed in **Section 6**.

In April / May, water samples were collected for the Bacteriological Activity Reaction Test (BART); BART was not completed in fall in 2023 due to RW 1-87/14 preventative well maintenance and RW 2-63/17 being offline (due to pump failure).

⁷ http://www.bclaws.ca/civix/document/id/loo71/loo71/10_200_2003

⁸ Environmental health officers routinely inspect, sample, and assess community water systems for compliance with the Drinking Water Protection Act and Regulation (www.fraserhealth.ca).

⁹ July 7, 2023: no sample was collected from Reservoir C (offline); December 20, 2023: no sample was collected from RW 2-63/17 (offline).

CWD has installed pH meters connected to the water manifold which allows for continuous monitoring. The pH meters we assembled, installed, and calibrated by CWD's Water Quality Technician.

CWD meets every year with FHA Drinking Water Officer and students for a tour and inspection of the water system. In 2023 this was organized on May 10, 2023.



IMAGE | IN ADDITION TO WATER TESTING – IN HOUSE MICRO BIOLOGICAL ANALYSIS, WEEKLY COMPLETED BY THE WATER QUALITY TECHNICIAN.

5.2 Water Quality Technician's Report 2023

The second half of 2023 into 2024 was yet another interesting period, complete with several unique challenges and accomplishments.

Clearbrook Waterworks once again entered its award-winning water in the Berkeley Springs International Water Tasting Competition in February 2023 and added another gold medal to our collection.

Routine sampling for Total Coliforms and E Coli was performed, with 363 in house samples taken, and 228 samples submitted to the BCCDC. 31 HPC (Heterotrophic Plate Count) samples were also processed in house. BART sampling took place in mid-April, with the Q4 BART being cancelled due to well failure/awaiting parts and scheduled well rehabilitation at the Autumn wellfield. 2024 BART will take place in April, and hopefully a second round in October-November.

In June of 2023, CWD field staff drained Reservoir C. The original intended purpose of this work was to replace the aging overflow pipe in order to extend the working life of this reservoir until its scheduled replacement in 2035. Upon draining, it was discovered that most of the corrosion on the overflow pipe (originally observed by divers during routine cleaning) was superficial. In lieu of replacing the pipe, it was instead decided we would remove the surface corrosion and apply an NSF 61 (approved for drinking water use) coating in order to extend its service life until reservoir replacement. After this work was completed, the reservoir was cleaned (including positive removal of all tools and materials used during the work), and the floor of the reservoir was power washed. At this point, the reservoir was filled, drained (rinsed), and disinfected as per AWWA Standard C652 specifications. After draining the chlorinated water, the reservoir was once again filled with clean water, and tested for Total Coliform and E.coli bacteria. The samples came back negative, and the reservoir was returned to service.

After completion of the reservoir work, we commenced the replacement of roughly 235 meters of 150mm AC pipe. Due to the extended duration of the aforementioned reservoir work, the pipe replacement project didn't start until late July. Installing the new watermain was met with several difficulties, including trench depth, rocky/dry soil conditions, and proximity to our existing watermain. The vibration from our work likely disturbed the biofilm in the existing watermain and resulted in several reports of discoloration of the water in the area. The issue was resolved with several rounds of flushing and confirmed via bacteriological sampling in the local area. After pressure testing, disinfection, and bacteriological testing, the new watermain was tied-in to the system in late November.

Due to the reservoir maintenance and pipe replacement projects undertaken in 2023, the fall flushing was not performed, and instead a unidirectional flushing program was started in early January 2024 and completed in early February. It was decided to forego the Berkeley Springs International Water Tasting Competition in 2024 and re-evaluate for 2025.

2024 will bring with it another pipe replacement project in the summer months, and all of the unique challenges that go along with installing watermain in a sanitary fashion, as we maintain our demanding standard of water quality. We said goodbye to distribution system operator Cole O'Malley earlier this year Craig Desnoyers was hired. Craig has enough hours in water distribution to write his Operator Level 1 exam later this summer.

Well RW 3-93/11 (the oldest of our currently operating production wells) is scheduled for rehabilitation later this year, and it is always interesting to see the before and after camera footage of the well screen and casing condition.

Ryan Federau
Water Quality
Clearbrook Waterworks District



**IMAGE | ROYAL
ST. LOOP
PROJECT –250-MM
BIONAX® PIPE.**

6. Water Quality Review

6.1 Water Quality Review

Water samples were collected by CWD from the supply source (RW 3-93/11, RW 7-00/13, RW 1-87/14, RW 2-63/17), and Reservoir C¹⁰ on January 5 (delayed from December 2022), July 7, 2023, and December 20, 2023. Furthermore, water samples were collected from two sample stations in the District (2464 Sunnyside and 32350 Diamond Crescent). The water samples were analyzed by Element, an accredited laboratory located in Surrey B.C. **Table 1** (next page) summarizes the results of the water quality analysis, which are evaluated towards the most recent edition of the Canadian Drinking Water Guidelines (Health Canada 2022). The reports prepared by Element are included as **Appendix D**.

Results of the water analysis for the four replacement wells and the reservoirs suggest that the water quality meets the Canadian Drinking Water Guidelines requirements in terms of Maximum Acceptable Concentrations (MAC) and Aesthetic Objective (AO), with exception of:

- ✓ Manganese concentration of 0.060 mg/L, 0.070 mg/L, and 0.072 mg/L was reported for the water samples collected from **RW 1-87/14**, on January 5, July 18, and December 20, 2024, respectively: concentrations value exceeds the AO of 0.02 mg/L - *historically, **RW 1-87/14** shows a tendency towards elevated manganese concentration but has always been below Maximum Acceptable Concentration (MAC)*¹¹.

The Canadian Drinking Water Guidelines Summary Table (September 2022), available at <https://www.canada.ca>, provides information for the various analyzed water quality parameters pertaining to guideline limits, common sources (of the parameter), and health considerations.

Based on the reported results for the production wells:

- ✓ pH values range between 6.97 (**RW 7-00/13**) to 7.58 (**RW 1-87/14**) which suggests that the sampled water is overall basic (pH > 7.0) – pH = 7.0 is considered “pH neutral”.
- ✓ Water hardness (as CaCO₃)¹² ranges from 86 mg/L (**RW 7-00/13**) to 138 mg/L (**RW 3-93/11**) and suggests moderately hard to hard water at all four production wells (Moderately hard water ranges from 60 mg/L to less than 120 mg/L; hard water ranges from 120 mg/L to less than 180 mg/L).
- ✓ Turbidity values range from < 0.10 NTU (*4 samples*) to 0.48 NTU (RW 2-63/17).

¹⁰ Water samples were collected and submitted to Element by Ryan Federau (CWD Water Quality Technician).

¹¹ Health (2022) has set AO and MAC guidelines for manganese.

¹² Hardness is evaluated based on the concentration of calcium carbonate (CaCO₃), because calcium (Ca²⁺) and carbonate (CO₃²⁻) are the dominant ions in most hard waters.

Table 1

Water Quality

Results

Description / Analyte	Extractable / Dissolved / Other	Units	Guideline Limit	Guideline Type	Results							Detection Limit
					Raw groundwater (Matrix: Drinking Water)							
Sample Description					RW 3-93/11	RW 7-00/13	RW 1-87/14	RW 2-63/17	Reservoir C	32350 Diamond Cres	2464 Sunnyside PL	
Report Id					2832325	2832325	2832325	2832325	2832325	2832325	2832325	
Lot ID					1624307	1624307	1624307	1624307	1624307	1624307	1624307	
Lot Reference No.					3	4	1	2	5	6	7	
Received Date					2023-01-05	2023-01-05	2023-01-05	2023-01-05	2023-01-05	2023-01-05	2023-01-05	
Sample Date					2023-01-05	2023-01-05	2023-01-05	2023-01-05	2023-01-05	2023-01-05	2023-01-05	
Sampled Time					9:15:00 AM	9:33:00 AM	9:03:00 AM	8:50:00 AM	10:36:00 AM	9:48:00 AM	8:38:00 AM	
Completed Date					2023-01-10	2023-01-10	2023-01-10	2023-01-10	2023-01-10	2023-01-10	2023-01-10	
Analyte												
Aluminum	Extractable	mg/L	0.1	OG	<0.001	0.001	<0.001	0.002	<0.001	<0.001	0.001	0.001
Antimony	Extractable	mg/L	0.006	MAC	0.00004	0.00003	0.00015	0.00010	0.00008	0.00004	0.00009	0.00002
Arsenic	Extractable	mg/L	0.010	MAC	0.0003	0.0003	0.0018	0.0008	0.0007	0.0005	0.0006	0.0001
Barium	Extractable	mg/L	1	MAC	0.0099	0.0075	0.027	0.016	0.014	0.011	0.013	0.0001
Boron	Extractable	mg/L	5	MAC	0.013	0.011	0.039	0.020	0.017	0.011	0.017	0.002
Cadmium	Extractable	mg/L	0.005	MAC	0.00003	0.00003	0.00002	0.00002	0.00001	0.00002	<0.00001	0.00001
Chromium	Extractable	mg/L	0.05	MAC	0.00015	0.00026	<0.00005	0.00007	0.00013	0.00023	0.00014	0.00005
Copper	Extractable	mg/L	1 AO; 2 MAC		0.0017	0.0026	<0.0005	<0.0005	<0.0005	0.0024	0.013	0.0005
Lead	Extractable	mg/L	0.01	MAC	0.00007	0.00012	<0.00001	<0.00001	<0.00001	0.00083	0.0013	0.00001
Selenium	Extractable	mg/L	0.05	MAC	0.0004	<0.0002	<0.0002	0.0005	0.0004	0.0002	0.0006	0.0002
Strontium	Extractable	mg/L	7.0	MAC	0.15	0.11	0.10	0.093	0.11	0.11	0.098	0.0001
Uranium	Extractable	mg/L	0.02	MAC	0.00004	0.00002	0.00038	0.00013	0.00009	0.00002	0.00009	0.00001
Vanadium	Extractable	mg/L			0.00048	0.00049	0.00057	0.00044	0.00051	0.00045	0.00051	0.00005
Zinc	Extractable	mg/L	5.0	AO	0.0068	0.015	0.0007	0.0007	0.0006	0.0033	0.0041	0.0005
Total Coliforms	Enzyme Substrate	MPN/100 mL	0 per 100 mL	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
Escherichia coli	Enzyme Substrate	MPN/100 mL	0 per 100 mL	MAC	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
Heterotrophic Count -	SimPlate	MPN/mL	-		<2.0	33.0	<2.0	2.0	<2.0	4.0	8.0	2
Colour	True	Colour units	15	AO	<5	<5	<5	<5	<5	<5	<5	5
Turbidity		NTU	0.1	OG	<0.10	0.20	0.22	0.18	<0.10	<0.10	0.11	0.1
pH - Holding Time					Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	
pH	at 25 °C		7.0-10.5	OG	7.13	7.22	7.77	7.55	7.50	7.20	7.39	0.01
Electrical		µS/cm at 25			361	257	341	280	292	264	266	1
Calcium	Extractable	mg/L			39	27	35	31	31	28	29	0.01
Iron	Extractable	mg/L	0.3	AO	<0.004	0.004	<0.004	0.005	0.005	<0.004	0.004	0.004
Magnesium	Extractable	mg/L			9.4	6.3	9.3	7.7	7.5	6.4	7.0	0.02
Manganese	Extractable	mg/L	0.02 AO; 0.12 MAC		<0.001	0.012	0.060	0.012	0.005	0.003	0.002	0.001
Potassium	Extractable	mg/L			1.8	1.4	3.1	2.0	1.9	1.5	1.8	0.04
Silicon	Extractable	mg/L			11	10	7.4	8.8	9.6	10	9.1	0.005
Sodium	Extractable	mg/L	200	AO	12	8.6	20	11	11	9.0	9.6	0.1
T-Alkalinity	as CaCO3	mg/L			53	41	132	76	64	45	67	5
Chloride	Dissolved	mg/L	250	AO	61.5	38.7	15.9	23.8	35.0	37.5	24.4	0.05
Fluoride	Dissolved	mg/L	1.5	MAC	0.02	0.02	0.05	0.03	0.03	0.02	0.03	0.01
Nitrate - N	Dissolved	mg/L	10	MAC	2.03	2.50	0.03	1.20	1.80	2.46	1.48	0.01
Nitrite - N	Dissolved	mg/L	1	MAC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Sulfate (SO4)	Dissolved	mg/L	500	AO	19.6	14.6	22.5	22.1	18.9	14.8	20.6	0.1
Hardness	as CaCO3	mg/L			136	92	126	110	108	97	101	1
Total Dissolved	Extractable	mg/L	500	AO	213	159	205	173	178	163	164	1

Table 1

Water Quality

Results, *cont'd...*

Description / Analyte	Extractable / Dissolved / Other	Units	Guideline Limit	Guideline Type	Results							Detection Limit
					Raw groundwater (Matrix: Drinking Water)							
Sample Description					RW 3-93/11	RW 7-00/13	RW 1-87/14	RW 2-63/17	Reservoir C	32350 Diamond Cres	2464 Sunnyside PL	
Report Id					2895128	2895128	2895128	2895128	Not samples were collected (due to maintenance-- installation of the mechanical mixer)	2895128	2895128	
Lot ID					1666058	1666058	1666058	1666058		1666058	1666058	
Lot Reference No.					3	4	1	2		5	6	
Received Date					2023-07-18	2023-07-18	2023-07-18	2023-07-18		2023-07-18	2023-07-18	
Sample Date					2023-07-18	2023-07-18	2023-07-18	2023-07-18		2023-07-18	2023-07-18	
Sampled Time					11:36:00 AM	12:16:00 PM	10:51:00 AM	10:05:00 AM		11:53:00 AM	12:03:00 PM	
Completed Date					2023-07-20	2023-07-20	2023-07-20	2023-07-20		2023-07-20	2023-07-20	
Analyte												
Aluminum	Extractable	mg/L	0.1	OG	<0.001	0.002	<0.001	0.008		0.007	0.003	0.001
Antimony	Extractable	mg/L	0.006	MAC	0.00003	0.00003	0.00011	0.00010		0.00008	0.00008	0.00002
Arsenic	Extractable	mg/L	0.010	MAC	0.0003	0.0003	0.0019	0.0009		0.0008	0.0009	0.0001
Barium	Extractable	mg/L	1	MAC	0.0080	0.0065	0.026	0.016		0.014	0.015	0.0001
Boron	Extractable	mg/L	5	MAC	0.014	0.012	0.036	0.022		0.020	0.022	0.002
Cadmium	Extractable	mg/L	0.005	MAC	0.00003	0.00002	0.00001	0.00001		<0.00001	0.00001	0.00001
Chromium	Extractable	mg/L	0.05	MAC	0.00021	0.00024	<0.00005	0.00033		0.00009	0.00013	0.00005
Copper	Extractable	mg/L	1 AO; 2 MAC		0.0016	0.0027	<0.0005	<0.0005		0.0043	0.0024	0.0005
Lead	Extractable	mg/L	0.01	MAC	0.00008	0.00013	<0.00001	<0.00001		0.00077	0.00066	0.00001
Selenium	Extractable	mg/L	0.05	MAC	0.0003	<0.0002	<0.0002	0.0005		0.0005	0.0004	0.0002
Strontium	Extractable	mg/L	7.0	MAC	0.14	0.11	0.11	0.100		0.11	0.11	0.0001
Uranium	Extractable	mg/L	0.02	MAC	0.00003	0.00002	0.00034	0.00012		0.00009	0.00011	0.00001
Vanadium	Extractable	mg/L			0.00049	0.00050	0.00053	0.00046		0.00049	0.00056	0.00005
Zinc	Extractable	mg/L	5.0	AO	0.0053	0.011	<0.0005	0.0007		0.011	0.011	0.0005
Total Coliforms	Enzyme Substrate	MPN/100 mL	0 per 100 mL	MAC	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	1.0
Escherichia coli	Enzyme Substrate	MPN/100 mL	0 per 100 mL	MAC	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	1.0
Heterotrophic Count -	SimPlate	MPN/mL	-		<2.0	4.0	<2.0	<2.0		59.0	2.0	2
Colour	True	Colour units	15	AO	<5	<5	<5	<5		<5	<5	5
Turbidity		NTU	0.1	OG	0.38	0.18	<0.10	0.48		0.21	0.16	0.1
pH - Holding Time					Exceeded	Exceeded	Exceeded	Exceeded		Exceeded	Exceeded	
pH	at 25 °C		7.0-10.5	OG	7.00	6.99	7.58	7.41		7.34	7.42	0.01
Electrical		µS/cm at 25			309	240	353	287		285	294	1
Calcium	Extractable	mg/L			32	24	37	31		31	32	0.01
Iron	Extractable	mg/L	0.3	AO	0.006	0.011	<0.004	0.016		0.011	0.010	0.004
Magnesium	Extractable	mg/L			7.6	6.0	9.3	7.5		7.0	7.2	0.02
Manganese	Extractable	mg/L	0.02 AO; 0.12 MAC		0.001	0.002	0.070	0.009		0.002	0.002	0.001
Potassium	Extractable	mg/L			1.7	1.3	3.2	2.0		1.8	2.1	0.04
Silicon	Extractable	mg/L			10	11	7.7	8.8		9.4	9.3	0.005
Sodium	Extractable	mg/L	200	AO	11	8.4	20	11		10	12	0.1
T-Alkalinity	as CaCO3	mg/L			48	41	130	77		71	74	5
Chloride	Dissolved	mg/L	250	AO	44.9	30.6	16.1	22.9		24.8	26.8	0.05
Fluoride	Dissolved	mg/L	1.5	MAC	0.02	0.02	0.04	0.03		0.03	0.03	0.01
Nitrate - N	Dissolved	mg/L	10	MAC	2.33	2.36	0.04	1.12		1.34	1.41	0.01
Nitrite - N	Dissolved	mg/L	1	MAC	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	0.01
Sulfate (SO4)	Dissolved	mg/L	500	AO	16.1	14.5	23.1	22.2		21.1	20.2	0.1
Hardness	as CaCO3	mg/L			111	86	130	108		105	108	1
Total Dissolved	Extractable	mg/L	500	AO	181	149	208	171		170	175	1

Table 1

Water Quality

Results, *cont'd*...

Description / Analyte	Extractable / Dissolved / Other	Units	Guideline Limit	Guideline Type	Results							Detection Limit
					Raw groundwater (Matrix: Drinking Water)							
Sample Description					RW 3-93/11	RW 7-00/13	RW 1-87/14	RW 2-63/17	Reservoir C	32350 Diamond Cres	2464 Sunnyside PL	
Report Id					2957979	2957979	2957979	Not samples were collected (no pumping system in the well)	2957979	2957979	2957979	
Site ID					1703100	1703100	1703100		1703100	1703100	1703100	
Site Reference No.					2	3	1		4	5	6	
Received Date					2023-12-20	2023-12-20	2023-12-20		2023-12-20	2023-12-20	2023-12-20	
Sample Date					2023-12-20	2023-12-20	2023-12-20		2023-12-20	2023-12-20	2023-12-20	
Sampled Time					9:50:00 AM	10:19:00 AM	11:26:00 AM		8:51:00 AM	10:51:00 AM	9:14:00 AM	
Completed Date					2023-12-28	2023-12-28	2023-12-28		2023-12-28	2023-12-28	2023-12-28	
Analyte												
Aluminum	Extractable	mg/L	0.1	OG	<0.001	<0.001	0.002		0.001	<0.001	<0.001	0.001
Antimony	Extractable	mg/L	0.006	MAC	0.00008	0.00003	0.00014		0.00008	0.00012	0.00014	0.00002
Arsenic	Extractable	mg/L	0.010	MAC	0.0004	0.0004	0.0014		0.0007	0.0010	0.0010	0.0001
Barium	Extractable	mg/L	1	MAC	0.0085	0.0065	0.022		0.013	0.014	0.014	0.0001
Boron	Extractable	mg/L	5	MAC	0.010	0.010	0.022		0.015	0.019	0.022	0.002
Cadmium	Extractable	mg/L	0.005	MAC	0.00007	0.00003	0.00001		0.00002	0.00001	0.00001	0.00001
Chromium	Extractable	mg/L	0.05	MAC	0.00020	0.00030	0.00013		0.00017	0.00011	0.00010	0.00005
Copper	Extractable	mg/L	1 AO; 2 MAC		0.0012	0.0017	<0.0005		<0.0005	0.0026	0.0020	0.0005
Cobalt	Extractable	mg/L	0.01	MAC	0.00008	0.00017	<0.00001		0.00001	0.00030	0.00030	0.00001
Selenium	Extractable	mg/L	0.05	MAC	0.0003	0.0002	0.0005		0.0004	0.0005	0.0004	0.0002
Iron	Extractable	mg/L	7.0	MAC	0.14	0.10	0.090		0.11	0.099	0.096	0.0001
Manganese	Extractable	mg/L	0.02	MAC	0.00007	0.00001	0.00016		0.00009	0.00015	0.00016	0.00001
Nickel	Extractable	mg/L			<0.00005	<0.00005	0.00018		<0.00005	<0.00005	<0.00005	0.00005
Copper	Extractable	mg/L	5.0	AO	0.0067	0.017	0.0044		0.0019	0.010	0.018	0.0005
Total Coliforms	Enzyme Substrate	MPN/100 mL	0 per 100 mL	MAC	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	1.0
Escherichia coli	Enzyme Substrate	MPN/100 mL	0 per 100 mL	MAC	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	1.0
Heterotrophic Count -	SimPlate	MPN/mL	-		<2.0	4.0	177		137	62.0	53.0	2
Colour	True	Colour units	15	AO	<5	<5	<5		<5	<5	<5	5
Turbidity		NTU	0.1	OG	<0.10	<0.10	0.14		<0.10	<0.10	<0.10	0.1
4 - Holding Time					Exceeded	Exceeded	Exceeded		Exceeded	Exceeded	Exceeded	
Temperature	at 25 °C		7.0-10.5	OG	7.09	6.97	7.55		7.30	7.40	7.40	0.01
Electrical Conductivity		µS/cm at 25			331	248	284		312	285	283	1
Calcium	Extractable	mg/L			35	26	32		32	31	32	0.01
Iron	Extractable	mg/L	0.3	AO	0.012	<0.004	0.005		0.008	<0.004	<0.004	0.004
Magnesium	Extractable	mg/L			8.4	6.4	8.1		7.9	7.9	8.1	0.02
Manganese	Extractable	mg/L	0.02 AO; 0.12 MAC		<0.001	0.001	0.072		0.008	0.018	0.011	0.001
Potassium	Extractable	mg/L			1.8	1.4	2.6		2.0	2.3	2.4	0.04
Lithium	Extractable	mg/L			10	11	8.8		9.8	9.1	8.9	0.005
Sodium	Extractable	mg/L	200	AO	12	9.0	13		12	12	13	0.1
Alkalinity	as CaCO3	mg/L			48	40	93		67	86	91	5
Chloride	Dissolved	mg/L	250	AO	56.1	35.8	17.7		39.1	21.2	18.1	0.05
Sulfide	Dissolved	mg/L	1.5	MAC	<0.01	<0.01	0.02		<0.01	0.02	0.02	0.01
Nitrate - N	Dissolved	mg/L	10	MAC	2.24	2.40	0.83		1.62	0.99	0.86	0.01
Nitrite - N	Dissolved	mg/L	1	MAC	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	0.01
Sulfate (SO4)	Dissolved	mg/L	500	AO	16.9	14.6	23.0		19.8	22.6	23.3	0.1
Hardness	as CaCO3	mg/L			122	90	112		114	111	112	1
Total Dissolved Solids	Extractable	mg/L	500	AO	197	156	179		187	178	179	1

Regarding turbidity: Health Canada has set water treatment limits regarding turbidity (not applicable to CWD's water system)¹³. Even so, for good operation of the distribution system, it is recommended (for systems that use groundwater) that the water entering the distribution system has turbidity levels of 1.0 NTU or less (Health Canada 2022).

Comprehensive Water Quality Analysis

A comprehensive water quality analysis was completed for RW 2-63/17 on July 18, 2023. The water samples were analyzed for *polycyclic aromatic hydrocarbons* (PAHs), *chlorinated hydrocarbons*, *haloacetic acids*, *volatile organic compounds* (VOC), *pesticides*, and *herbicides*. Results suggest that the concentrations of the constituents were all found to be below their nominal detection limits. The analysis included the analysis of various metal concentrations; results suggests that the metal concentrations were all found to be below the guideline limits (Health Canada 2022), where applicable. **Appendix E** includes the water quality report.



Summary

- Based on the results of the water quality analysis CWD's drinking water is safe and does not require any treatment.
- Based on the evaluation of hardness, CWD'S drinking water does not require any water softeners.

Contact CWD office for any questions regarding the quality of our drinking water.

¹³ Guidelines apply to individual filter turbidity for systems using surface water or groundwater under the direct influence of surface water (Health Canada 2019).

6.2 Biological Activity Reaction Test

BART is a method for analyzing several bacterial communities that can cause problems for water quality (e.g.: turbidity), aesthetics (e.g.: odour, discoloration, cloudiness) and water infrastructure (e.g.: corrosion). The following bacterial communities were analyzed this year for each production well:

- **Iron Related Bacteria (IRB)**
- **Sulphate Reducing Bacteria (SRB)**
- **Slime Forming Bacteria (SLYM)**
- **Heterotrophic Aerobic Bacteria (HAB).**

These four indicators are typically used for water supply wells to obtain insight into corrosion risk and/or well screen clogging risk (a quantitative diagnostic). High aggressivity of these bacteria could also suggest masking of coliform bacteria¹⁴.

BART was completed in April / May of 2023. Fall BART was not completed due to scheduled well preventative maintenance for RW 1-87/14 in November and RW 2-63/17 being offline due to pump failure.

Table 2 summarizes the results using color coding in terms of level of aggressivity of evaluated bacteria for each well: *in the well* (time $t = 1$ min of pumping), *just outside the well screen* ($t = 10$ min of pumping), and in the *geological formation* ($t = 60$ min of pumping). We included orange color coding to reflect the borderline between medium and high aggressivity (applicable for IRB).

BART analysis shows that reactions occurred mostly for **IRB** and **HAB**. Typically, **IRB** was found to be either '**aggressive**' (4 samples) or the borderline of '**moderate and aggressive**' (3 samples), but also moderate (2 samples) and low aggressive (1 sample). **HAB** was found to be mostly low in aggressivity. Regarding SLYM, there was one sample with low aggressivity and one sample with moderate aggressivity.

Overall, and historically, IRB and HAB are the most common bacteria (microbes) identified during the tests (i.e.: show borderline or high aggressivity). Generally speaking, microbes are ever present in a well environment, and based on our long-term implementation of BART, the degree of aggressivity of the various bacterial communities varies over time for each of the wells.

BART results in combination with well hydraulic performance data and the interior condition of the well and well screen (i.e.: degree of plugging), observed during the completion of a downhole video inspections, determine well rehabilitation requirements (timing and approach).

¹⁴ <http://www.dbi.ca/BARTs/App-Guide.html>.

Table 2 - BART Results (2023)

Tester	Spring 2023			Fall 2023		
	Well	Outside well screen	Formation	Well	Outside well screen	Formation
	(t = 1 min)	(t = 10 min)	(t = 60 min)	(t = 1 min)	(t = 10 min)	(t = 60 min)
Bacterial communities	RW 3-93/11 - Sample Date: May 2, 2023			RW 3-93/11		
IRB	4 BR [8.82 T]	5 BR [2.2 T]	6 BR [550]	BART was not completed in fall		
SRB	-	-	-			
SLYM	8 CL, 5 DS [93]	-	-			
HAB	4 DO [7.44 T]	4 DO [7.44 T]	5 DO [1.59 T]			
Bacterial communities	RW 7-00/13 - Sample Date: April 25, 2023			RW 7-00/13		
IRB	4 FO [8.82 T]	4 FO [8.82 T]	5 BR [2.2 T]	BART was not completed in fall		
SRB	-	-	-			
SLYM	-	-	-			
HAB	4 DO [7.44 T]	3 DO [47.8 T]	5 UP [1.59 T]			
Bacterial communities	RW 1-87/14 - Sample Date: April 25, 2023			RW 1-87/14		
IRB	5 BR [2.2 T]	-	-	BART was not completed in fall		
SRB	-	-	-			
SLYM	-	-	-			
HAB	-	-	9 UP [31]			
Bacterial communities	RW 2-63/17 - Sample Date: May 2, 2023			RW 2-63/17		
IRB	4 BR, 6 BL [8.82 T]	9 BR [8]	6 BR, 9 BL [550]	BART was not completed in fall		
SRB	-	-	8 BT [31]			
SLYM	4 CL, 5 DS [11.1 T]	-	-			
HAB	4 DO [7.44 T]	5 DO [1.59 T]	7 UP [155]			

Key:

	High aggressive
	Borderline moderate- high aggressive
	Moderate aggressive
	Low aggressive
-	No reaction

7. References

Health Canada. 1979. Hardness - Technical Document, February 1979 (reprinted 1995). Available at: <http://www.hc-sc.gc.ca>.

Health Canada. 2022. Guidelines for Canadian Drinking Water Quality. Summary table. Drinking Water Guidelines. Prepared by the Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment. Available at <http://www.hc-sc.gc.ca> (most recent update of on-line version: September 2022).

Appendices

Appendix A

Metals in Drinking Water “Flush” Message from Fraser Health Authority



March 3, 2023

Water System Operators

Re: Metals in Drinking Water – “Flush” Message in Annual Reports

Anytime the water in a particular faucet has not been used for six hours or longer, "flush" your cold-water pipes by running the water until you notice a change in temperature. (This could take as little as five to thirty seconds if there has been recent heavy water use such as showering or toilet flushing. Otherwise, it could take two minutes or longer.) The more time water has been sitting in your home's pipes, the more lead it may contain.

Use only water from the cold-tap for drinking, cooking, and especially making baby formula. Hot water is likely to contain higher levels of lead.

The two actions recommended above are very important to the health of your family. They will probably be effective in reducing lead levels because most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.

Conserving water is still important. Rather than just running the water down the drain you could use the water for things such as watering your plants.

If you have any questions, please contact our Drinking Water Program at 604-870-7903 or 1-866-749-7900.

Sincerely,

Blair Choquette
Manager, Drinking Water Program
Health Protection

Appendix B

Preventing Water-Borne Infections for People with Weakened Immune Systems (HealthLinkBC)

Preventing water-borne infections for people with weakened immune systems

Who is at higher risk from water-borne infections?

People with very weak immune systems who are at higher risk of certain water-borne diseases include those with:

- HIV infection who have a CD4+ count of less than 100 cells/mm³;
- lymphoma or leukemia (hematological malignancies) who are being actively treated or have been in remission and off treatment for less than 1 year;
- hematopoietic stem cell transplant recipients; and
- people born with diseases that severely affect their immune systems.

Some people with weakened immune systems, such as those with certain types of cancers or taking certain medications, may not be at higher risk of severe water-borne diseases. These people do not need to take extra precautions with their drinking water.

Ask your doctor or nurse practitioner how weak your immune system is, and whether you need to take extra precautions.

How can drinking water become contaminated?

Drinking water can contain different organisms, including bacteria, viruses and parasites, which can cause disease. These organisms can exist in the source water, such as lake water, and survive through treatment, or they can enter the water supply in the distribution system.

Well water can be contaminated if the well is located or constructed in a way that the groundwater it draws from is at risk of

containing pathogens (germs) such as a shallow well or a well drilled in fractured rock.

Surface water, such as rivers, lakes and streams, can also contain disease-causing organisms from animal feces.

If you have a weak immune system, you should not drink water from surface sources or groundwater at risk of containing pathogens, unless the water has been treated to remove or inactivate at least 99.9 per cent of parasites (protozoa), 99.99 per cent of viruses and all harmful bacteria.

Most community water systems in B.C. have effective treatment, such as disinfection or chlorination, against bacteria and viruses. However, in many cases, treatment may not provide a 99.9 per cent reduction in infectious parasites. Some water systems and many private supplies have no treatment at all. If the water you drink has not been disinfected, please refer to [HealthLinkBC File #49b Disinfecting drinking water](#).

How can I further treat disinfected water?

People with very weak immune systems should consult with their doctor or nurse practitioner and may need to take extra precautions with their drinking water.

Boiling: If your water supply has already been disinfected, bring the water to a full boil to inactivate any *Cryptosporidium* parasites - a major concern for people with weakened immune systems. For more information, see [HealthLinkBC File #48 Cryptosporidium infection](#).

If the water has not already been disinfected, bring the water to a full boil for at least 1 minute. This will kill or inactivate bacteria, viruses and parasites. At elevations over 2,000

meters (6,500 feet), boil water for at least 2 minutes to disinfect it.

Do not drink or use tap water to brush your teeth, rinse your mouth, mix drinks or make ice cubes without boiling it first.

Please note that boiling water will get rid of viruses, bacteria and parasites but not chemicals which may be found in the water.

Reverse Osmosis (RO): RO is effective against all disease-causing organisms and many chemical contaminants. Unless it has a high capacity, it will only produce small amounts of water and waste a large volume. Speak to a water treatment specialist to see if this is the best option for you.

Ultraviolet (UV) Treatment: UV light will kill many disease-causing organisms, and is effective against almost all parasites. UV will not kill some bacterial spores and some viruses, so it should not be used unless the water supply is at least disinfected. UV treatment units should meet NSF Standard #55A.

Filters: Filters do not remove bacteria and viruses and should not be used unless the water supply is disinfected first.

If you plan to install a drinking water filter in your home, you will need a system labeled as Absolute 1 micron or smaller, and labeled as meeting ANSI/NSF International Standard #53 for removal of parasites.

Jug-type filters, such as a Brita®, which sit in a jug and allow water to trickle through, and some tap-mounted and built-in devices are not an appropriate solution. The jug filter models are not effective in removing many disease-causing organisms.

Can I drink bottled water?

Bottled water in B.C. may or may not have been treated. If you have a very weak immune system, check with the bottling company to find out what treatment, if any, it has had. Bottled water that has been properly treated using one of the methods listed above can be used for drinking, brushing teeth, making ice cubes and for recipes where water is used but not boiled, such as cold soups.

For more information

For more information, including the level of treatment in your local water system, contact your drinking water purveyor or supplier, or the local environmental health officer or drinking water officer. To find your health authority's drinking water contact visit

www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/drinking-water-quality/health-authority-contacts.

For more information about water-borne infections and how to safely disinfect your drinking water, see the following HealthLinkBC Files:

- [HealthLinkBC File #49a Water-borne infections in British Columbia](#)
- [HealthLinkBC File #49b Disinfecting drinking water](#)
- [HealthLinkBC File #69b Feeding your baby formula: Safely making and storing formula](#)

For more HealthLinkBC File topics, visit www.HealthLinkBC.ca/healthfiles or your local public health unit. For non-emergency health information and advice in B.C. visit www.HealthLinkBC.ca or call **8-1-1** (toll-free). For the deaf and hard of hearing, call **7-1-1**. Translation services are available in more than 130 languages on request.

Appendix C

Sample Range Report (Fraser Health Authority)

Sample Range Report

Fraser Health Authority

Facility Name: Clearbrook Waterworks District

Date Range: Jan 1 2023 to Dec 31 2023

Operator Jason Hildebrandt
2889 Grandview Cres
Abbotsford, BC V2T 2R6

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
<u>31419 Springhill Court, 31419 Springhill Court</u>				
	1-24-2023 8:34:00 AM	LT1	LT1	
	2-21-2023 8:56:00 AM	LT1	LT1	
	4-3-2023 8:45:00 AM	LT1	LT1	
	5-15-2023 8:55:00 AM	LT1	LT1	
	6-27-2023 8:46:00 AM	LT1	LT1	
	8-8-2023 8:28:00 AM	LT1	LT1	
	9-18-2023 8:08:00 AM	LT1	LT1	
	10-31-2023 9:42:00 AM	LT1	LT1	
	12-12-2023 9:16:00 AM	<u>LT1</u>	<u>LT1</u>	
	Total Positive:	0	0	0
<u>2940 Clearbrook Rd.(Bible Col), 2940 Clearbrook Road</u>				
	1-3-2023 9:21:00 AM	LT1	LT1	
	2-6-2023 9:02:00 AM	LT1	LT1	
	3-13-2023 9:18:00 AM	LT1	LT1	
	4-11-2023 8:59:00 AM	LT1	LT1	
	5-15-2023 9:15:00 AM	LT1	LT1	
	6-20-2023 10:01:00 AM	LT1	LT1	
	7-17-2023 8:55:00 AM	LT1	LT1	
	8-21-2023 8:41:00	LT1	LT1	

AM			
9-25-2023 8:29:00	LT1	LT1	
AM			
10-23-2023 9:46:00	6	LT1	
AM			
11-27-2023 11:26:00	<u>LT1</u>	<u>LT1</u>	
AM			
Total Positive:	1	0	0

3089 Claudia Court,
3089 Claudia Court

1-3-2023 9:15:00	LT1	LT1	
AM			
1-30-2023 8:26:00	LT1	LT1	
AM			
3-6-2023 9:31:00	LT1	LT1	
AM			
4-11-2023 8:50:00	LT1	LT1	
AM			
5-8-2023 8:49:00	LT1	LT1	
AM			
6-12-2023 9:00:00	LT1	LT1	
AM			
7-17-2023 8:47:00	LT1	LT1	
AM			
8-14-2023 8:11:00	LT1	LT1	
AM			
9-18-2023 8:35:00	LT1	LT1	
AM			
10-23-2023 9:38:00	LT1	LT1	
AM			
11-20-2023 11:50:00	<u>1</u>	<u>LT1</u>	
AM			
Total Positive:	1	0	0

2889 Upland Cres,
2889 Upland Cres

1-3-2023 9:07:00	LT1	LT1
AM		
2-13-2023 8:45:00	LT1	LT1
AM		
3-27-2023 11:08:00	LT1	LT1
AM		
5-8-2023 8:32:00	LT1	LT1
AM		
6-20-2023 9:45:00	LT1	LT1
AM		
7-31-2023 11:56:00	LT1	LT1
AM		
9-11-2023 10:36:00	LT1	LT1
AM		
10-23-2023 9:04:00	1	LT1
AM		
12-5-2023 8:29:00	<u>OGO OGC</u>	<u>OGO OGC</u>

AM			
Total Positive:	1	0	0

2459 Centre Street
(at United Rentals),
2459 Centre Street
(at United Rentals)

1-3-2023 9:31:00 AM	LT1	LT1
2-13-2023 9:17:00 AM	LT1	LT1
3-6-2023 8:47:00 AM	LT1	LT1
4-11-2023 8:37:00 AM	LT1	LT1
5-15-2023 9:05:00 AM	LT1	LT1
6-12-2023 9:28:00 AM	LT1	LT1
7-17-2023 8:38:00 AM	LT1	LT1
8-21-2023 8:27:00 AM	LT1	LT1
9-18-2023 8:23:00 AM	LT1	LT1
10-23-2023 9:13:00 AM	LT1	LT1
11-27-2023 11:16:00 AM	<u>LT1</u>	<u>LT1</u>
Total Positive:	0	0

32171 South Fraser
Way (Petro
Canada), 32171
South Fraser Way
(Petro Canada)

1-24-2023 8:53:00 AM	LT1	LT1
3-6-2023 9:24:00 AM	LT1	LT1
4-3-2023 9:25:00 AM	LT1	LT1
5-1-2023 8:36:00 AM	LT1	LT1
6-12-2023 9:38:00 AM	LT1	LT1
7-10-2023 7:57:00 AM	LT1	LT1
8-8-2023 8:45:00 AM	ESTCT 2 ESTHCD	LT1
9-11-2023 9:20:00 AM	1	LT1
10-16-2023 8:54:00 AM	LT1	LT1

11-14-2023 8:33:00 AM	LT1	LT1	
12-18-2023 9:20:00 AM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	2	0	0

2749 Braeside
Street, 2749
Braeside Street

1-30-2023 8:07:00 AM	LT1	LT1	
2-27-2023 11:13:00 AM	LT1	LT1	
4-11-2023 8:21:00 AM	LT1	LT1	
5-23-2023 8:21:00 AM	LT1	LT1	
7-4-2023 11:59:00 AM	LT1	LT1	
8-14-2023 7:58:00 AM	1	LT1	
9-25-2023 8:06:00 AM	LT1	LT1	
11-6-2023 9:23:00 AM	1	LT1	
12-18-2023 8:30:00 AM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	2	0	0

Reservoir C (1985).
2889 Grandview
Cres

1-3-2023 8:39:00 AM	LT1	LT1	
9-5-2023 9:15:00 AM	LT1	LT1	
10-31-2023 9:58:00 AM	<u>5</u>	<u>LT1</u>	
Total Positive:	1	0	0

2903 Palm Crescent.
2903 Palm Crescent

1-24-2023 8:43:00 AM	LT1	LT1
2-21-2023 8:46:00 AM	LT1	LT1
3-27-2023 11:18:00 AM	LT1	LT1
5-1-2023 8:15:00 AM	LT1	LT1
5-29-2023 9:09:00 AM	LT1	LT1
7-4-2023 11:51:00	LT1	LT1

AM			
8-8-2023 8:36:00	LT1	LT1	
AM			
9-5-2023 7:54:00	LT1	LT1	
AM			
10-10-2023 7:30:00	LT1	LT1	
AM			
11-14-2023 7:57:00	1	LT1	
AM			
12-12-2023 9:24:00	<u>LT1</u>	<u>LT1</u>	
AM			
Total Positive:	1	0	0

2464 Sunnyside
Place, 2464
Sunnyside Place

1-9-2023 8:35:00	LT1	LT1	
AM			
3-13-2023 8:46:00	LT1	LT1	
AM			
4-24-2023 9:00:00	LT1	LT1	
AM			
6-5-2023 8:09:00	LT1	LT1	
AM			
7-17-2023 8:19:00	LT1	LT1	
AM			
8-28-2023 8:09:00	LT1	LT1	
AM			
10-10-2023 8:22:00	LT1	LT1	
AM			
11-20-2023 11:34:00	<u>2</u>	<u>LT1</u>	
AM			
Total Positive:	1	0	0

2664 Albert Way,
2664 Albert Way

1-17-2023 8:15:00	LT1	LT1	
AM			
3-6-2023 8:39:00	REJECT LKS2	REJECT LKS2	
AM			
4-18-2023 7:39:00	LT1	LT1	
AM			
5-29-2023 9:25:00	LT1	LT1	
AM			
7-10-2023 8:08:00	LT1	LT1	
AM			
8-21-2023 8:18:00	LT1	LT1	
AM			
10-3-2023 8:56:00	LT1	LT1	
AM			
11-14-2023 8:09:00	<u>2</u>	<u>LT1</u>	
AM			
Total Positive:	1	0	0

2577 Victoria Street.
2577 Victoria St

1-9-2023 8:46:00 AM	LT1	LT1	
2-13-2023 9:07:00 AM	LT1	LT1	
3-20-2023 8:51:00 AM	LT1	LT1	
4-18-2023 7:48:00 AM	LT1	LT1	
5-23-2023 8:36:00 AM	LT1	LT1	
6-27-2023 9:17:00 AM	LT1	LT1	
7-24-2023 9:02:00 AM	LT1	LT1	
8-28-2023 8:30:00 AM	LT1	LT1	
10-3-2023 8:39:00 AM	LT1	LT1	
10-31-2023 9:32:00 AM	LT1	LT1	
12-5-2023 8:44:00 AM	<u>OGO OGC</u>	<u>OGO OGC</u>	
Total Positive:	0	0	0

31898 Royal
Crescent, 31898
Royal Crescent

1-30-2023 8:19:00 AM	LT1	LT1	
2-27-2023 11:19:00 AM	LT1	LT1	
4-3-2023 8:10:00 AM	LT1	LT1	
5-8-2023 8:42:00 AM	LT1	LT1	
6-5-2023 8:49:00 AM	LT1	LT1	
7-10-2023 7:45:00 AM	LT1	LT1	
8-14-2023 8:04:00 AM	LT1	LT1	
9-11-2023 10:02:00 AM	LT1	LT1	
10-16-2023 9:25:00 AM	LT1	LT1	
11-20-2023 11:58:00 AM	LT1	LT1	
12-18-2023 9:48:00 AM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	0	0	0

32073 Mt
Waddington Ave.
32073 Mt
Waddington Ave

1-17-2023 8:42:00 AM	LT1	LT1	
2-21-2023 9:07:00 AM	LT1	LT1	
3-27-2023 11:36:00 AM	LT1	LT1	
4-24-2023 8:42:00 AM	LT1	LT1	
5-29-2023 9:55:00 AM	LT1	LT1	
7-4-2023 1:03:00 PM	LT1	LT1	
7-31-2023 11:20:00 AM	LT1	LT1	
9-5-2023 8:15:00 AM	LT1	LT1	
10-10-2023 7:50:00 AM	LT1	LT1	
11-6-2023 9:57:00 AM	LT1	LT1	
12-12-2023 9:35:00 AM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	0	0	0

2425 Lynden Street.
2425 Lynden Street

1-24-2023 9:00:00 AM	LT1	LT1	
2-27-2023 11:52:00 AM	LT1	LT1	
3-27-2023 11:28:00 AM	LT1	LT1	
5-1-2023 8:43:00 AM	LT1	LT1	
6-5-2023 8:26:00 AM	LT1	LT1	
7-4-2023 1:29:00 PM	LT1	LT1	
8-8-2023 8:53:00 AM	LT1	LT1	
9-11-2023 9:40:00 AM	LT1	LT1	
10-10-2023 8:10:00 AM	LT1	LT1	
11-14-2023 8:22:00 AM	LT1	LT1	
12-18-2023 9:01:00 AM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	0	0	0

32350 Diamond
Cres. 32350
Diamond Cres

1-9-2023 9:08:00 AM	LT1	LT1	
2-6-2023 9:09:00 AM	LT1	LT1	
3-13-2023 9:38:00 AM	LT1	LT1	
4-18-2023 8:06:00 AM	LT1	LT1	
5-15-2023 9:22:00 AM	LT1	LT1	
6-20-2023 10:52:00 AM	LT1	LT1	
7-24-2023 9:23:00 AM	LT1	LT1	
8-21-2023 8:48:00 AM	LT1	LT1	
9-25-2023 8:38:00 AM	LT1	LT1	
10-31-2023 10:10:00 AM	LT1	LT1	
11-27-2023 11:34:00 AM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	0	0	0

2580 Langdon St -
East end of
driveway, 2580
Langdon St - East
end of driveway

1-17-2023 8:31:00 AM	LT1	LT1	
2-21-2023 9:15:00 AM	LT1	LT1	
3-20-2023 9:02:00 AM	LT1	LT1	
4-24-2023 8:39:00 AM	LT1	LT1	
5-29-2023 9:46:00 AM	LT1	LT1	
6-27-2023 9:27:00 AM	LT1	LT1	
7-31-2023 11:27:00 AM	LT1	LT1	
9-5-2023 8:25:00 AM	LT1	LT1	
10-3-2023 8:28:00 AM	LT1	LT1	
11-6-2023 9:49:00 AM	LT1	LT1	
12-12-2023 9:44:00 AM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	0	0	0

2743 Moorland St.
2743 Moorland St

2-6-2023 8:38:00 AM	LT1	LT1	
3-20-2023 8:33:00 AM	LT1	LT1	
5-1-2023 8:26:00 AM	LT1	LT1	
6-12-2023 9:16:00 AM	LT1	LT1	
7-24-2023 8:52:00 AM	LT1	LT1	
9-5-2023 8:04:00 AM	LT1	LT1	
10-16-2023 9:44:00 AM	LT1	LT1	
11-27-2023 11:06:00 AM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	0	0	0

31894 Duchess Ave.
31894 Duchess Ave

1-17-2023 8:22:00 AM	LT1	LT1	
2-13-2023 8:57:00 AM	LT1	LT1	
3-20-2023 8:44:00 AM	LT1	LT1	
4-24-2023 8:19:00 AM	LT1	LT1	
5-23-2023 8:28:00 AM	LT1	LT1	
6-27-2023 9:06:00 AM	LT1	LT1	
7-31-2023 11:22:00 AM	LT1	LT1	
8-28-2023 8:38:00 AM	LT1	LT1	
10-3-2023 8:47:00 AM	1	LT1	
11-6-2023 10:05:00 AM	LT1	LT1	
12-5-2023 8:37:00 AM	<u>LT1 GTR200</u>	<u>LT1 GTR200</u>	
Total Positive:	1	0	0

32138 George
Ferguson Way.
32138 George
Ferguson Way

1-30-2023 8:34:00 AM	LT1	LT1	
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2-27-2023 11:26:00 AM	LT1	LT1	
4-3-2023 9:00:00 AM	LT1	LT1	
5-8-2023 8:57:00 AM	LT1	LT1	
6-5-2023 8:54:00 AM	LT1	LT1	
7-10-2023 8:20:00 AM	LT1	LT1	
8-14-2023 8:19:00 AM	LT1	LT1	
9-18-2023 8:42:00 AM	LT1	LT1	
10-16-2023 9:14:00 AM	LT1	LT1	
11-20-2023 12:08:00 PM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	0	0	0

2548 Clearbrook
Rd., 2548
Clearbrook Rd.

1-9-2023 8:57:00 AM	LT1	LT1	
2-6-2023 8:50:00 AM	LT1	LT1	
3-13-2023 8:56:00 AM	LT1	LT1	
4-18-2023 7:56:00 AM	LT1	LT1	
5-23-2023 8:45:00 AM	LT1	LT1	
6-20-2023 11:07:00 AM	LT1 GTR200	LT1	
7-24-2023 9:12:00 AM	LT1	LT1	
8-28-2023 8:21:00 AM	LT1	LT1	
9-25-2023 8:16:00 AM	LT1	LT1	
10-31-2023 9:22:00 AM	LT1	LT1	
12-5-2023 8:54:00 AM	<u>LT1</u>	<u>LT1</u>	
Total Positive:	0	0	0

Reservoir B (2022),
2889 Grandview
Cres

1-30-2023 7:58:00 AM	LT1	LT1	
2-27-2023 11:06:00 AM	LT1	LT1	

4-3-2023 7:50:00 AM	LT1	LT1
5-1-2023 8:06:00 AM	LT1	LT1
6-5-2023 8:38:00 AM	LT1	LT1
7-4-2023 1:43:00 PM	LT1	LT1
7-31-2023 11:59:00 AM	LT1	LT1
10-3-2023 9:09:00 AM	LT1	LT1
12-5-2023 8:20:00 AM	<u>OGO OGC</u>	<u>OGO OGC</u>
Total Positive:	0	0

Result Values:	E - estimated	L - less than	G - greater than
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Samples that contain total coliform:	12	5.56% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of consecutive samples that contain total coliform:	1	
Number of samples that contain total coliform in last 30 days:	0/0	
Total number of samples:	216	

Comments:

Environmental Health Officer
Mar 26 2024

FOR FURTHER INFORMATION PLEASE CALL: David Fowler

Sample Range Report

Fraser Health Authority

Facility Name: RW 3-93

Date Range: Jan 1 2023 to Dec 31 2023

Operator

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
<u>RW 3-93, Lynden St</u>	1-30-2023 8:30:00 AM	LT1	LT1	
	6-5-2023 8:18:00 AM	LT1	LT1	
	10-3-2023 8:17:00 AM	<u>LT1</u>	<u>LT1</u>	
	Total Positive:	0	0	0

Result Values: **E - estimated** **L - less than** **G - greater than**

Samples that contain total coliform:	0	0.00% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of consecutive samples that contain total coliform:	0	
Number of samples that contain total coliform in last 30 days:	0/0	
Total number of samples:	3	

Comments:

Environmental Health Officer

Jun 20 2024

FOR FURTHER INFORMATION PLEASE CALL: David Fowler

Sample Range Report

Fraser Health Authority

Facility Name: Clearbrook Waterworks District

Date Range: Jan 1 2023 to Dec 31 2023

Operator Jason Hildebrandt
2889 Grandview Cres
Abbotsford, BC V2T 2R6

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
<u>Well RW 7 - 00/13,</u> <u>Lynden St</u>				
	4-3-2023 9:15:00 AM	LT1	LT1	
	7-31-2023 11:44:00 AM	LT1	LT1	
	12-5-2023 9:13:00 AM	<u>LT1</u>	<u>LT1</u>	
	Total Positive:	0	0	0

Result Values: **E - estimated** **L - less than** **G - greater than**

Samples that contain total coliform:	0	0.00% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of consecutive samples that contain total coliform:	0	
Number of samples that contain total coliform in last 30 days:	0/0	
Total number of samples:	3	

Comments:

Environmental Health Officer
Jun 20 2024

FOR FURTHER INFORMATION PLEASE CALL: David Fowler

Sample Range Report

Fraser Health Authority

Facility Name: Clearbrook Waterworks District

Date Range: Jan 1 2023 to Dec 31 2023

Operator Jason Hildebrandt
2889 Grandview Cres
Abbotsford, BC V2T 2R6

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
<u>RW 1-87-14,</u> <u>Autumn Ave</u>	1-3-2023 9:46:00 AM	LT1	LT1	
	5-1-2023 8:58:00 AM	LT1	LT1	
	9-5-2023 8:44:00 AM	LT1	LT1	
	10-31-2023 9:10:00 AM	<u>LT1</u>	<u>LT1</u>	
	Total Positive:	0	0	0

Result Values:

E - estimated

L - less than

G - greater than

Samples that contain total coliform:	0	0.00% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of consecutive samples that contain total coliform:	0	
Number of samples that contain total coliform in last 30 days:	0/0	
Total number of samples:	4	

Comments:

Environmental Health Officer

Mar 26 2024

FOR FURTHER INFORMATION PLEASE CALL: David Fowler

Sample Range Report

Fraser Health Authority

Facility Name: Clearbrook Waterworks District

Date Range: Jan 1 2023 to Dec 31 2023

Operator Jason Hildebrandt
2889 Grandview Cres
Abbotsford, BC V2T 2R6

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
<u>Well RW 2 - 63 ,</u> <u>Autumn Ave</u>	2-27-2023 11:44:00 AM	LT1	LT1	
	7-4-2023 1:21:00 PM	<u>LT1</u>	<u>LT1</u>	
	Total Positive:	0	0	0

Result Values: **E - estimated** **L - less than** **G - greater than**

Samples that contain total coliform:	0	0.00% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of consecutive samples that contain total coliform:	0	
Number of samples that contain total coliform in last 30 days:	0/0	
Total number of samples:	2	

Comments:

Environmental Health Officer
Jun 20 2024

FOR FURTHER INFORMATION PLEASE CALL: David Fowler

Appendix D

Water Quality Reports – Routine Water Quality Analysis (Element)

January 2023

Report Transmission Cover Page

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Contact	Company	Address
Accounts Payable	Clearbrook Waterworks District	2889 Grandview Crescent Abbotsford, BC V2T 2R6 Phone: (604) 850-6621 Fax: (604) 850-7862 Email: office@clearbrookwaterworks.com

Delivery	Format	Deliverables
Email - Single Deliverable	PDF	Invoice
Ineke Kalwij	Kalwij Water Dynamics Inc	P.O. Box 684 Station Main Port Coquitlam, BC V3B 6H9 Phone: (604) 615-4932 Fax: (604) 475-4062 Email: ineke@kalwijwaterdynamics.com

Delivery	Format	Deliverables
Email - Multiple Deliverables By Lot	PDF	COC / COA
Email - Multiple Deliverables By Lot	PDF	COC / Test Report
Email - Multiple Deliverables By Lot	Standard Crosstab Without Tabs	Test Report
Email - Single Deliverable	PDF	COA

Ryan Federau	Clearbrook Waterworks District	2889 Grandview Crescent Abbotsford, BC V2T 2R6 Phone: (604) 309-3986 Fax: (604) 850-7862 Email: ryan@clearbrookwaterworks.com
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Delivery	Format	Deliverables
Email - Merge Deliverables	PDF	COC / Test Report
Email - Single Deliverable	PDF	COA
Email - Single Deliverable	PDF	COR

Notes To Clients:

- Jan 06, 2023 - Reduction of analytical volume was necessary for chloride analysis to bring results within the analytical range for lot 1624307. Detection limits are adjusted accordingly.

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-1
Sample Date January 05, 2023
Sample Time 09:03
Sample Location
Sample Description RW 1-87/14 / 8.4°C
Sample Matrix Drinking Water

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable					
Aluminum	Extractable mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable mg/L	0.00015	0.00002	0.006	Below MAC
Arsenic	Extractable mg/L	0.0018	0.0001	0.010	Below MAC
Barium	Extractable mg/L	0.027	0.0001	2.0	Below MAC
Boron	Extractable mg/L	0.039	0.002	5	Below MAC
Cadmium	Extractable mg/L	0.00002	0.00001	0.007	Below MAC
Chromium	Extractable mg/L	<0.00005	0.00005	0.05	Below MAC
Copper	Extractable mg/L	<0.0005	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable mg/L	<0.00001	0.00001	0.005	Below MAC
Selenium	Extractable mg/L	<0.0002	0.0002	0.05	Below MAC
Strontium	Extractable mg/L	0.10	0.0001	7.0	Below MAC
Uranium	Extractable mg/L	0.00038	0.00001	0.02	Below MAC
Vanadium	Extractable mg/L	0.00057	0.00005		
Zinc	Extractable mg/L	0.0007	0.0005	5.0	Below AO
Microbiological Analysis					
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	<2.0	2	
Physical and Aggregate Properties					
Colour	True	Colour units	<5	5	
Turbidity		NTU	0.22	0.1	0.1/0.3/1.0 OG
Routine Water					
pH - Holding Time			Exceeded		
pH	at 25 °C		7.77	0.01	7.0-10.5
Electrical Conductivity		µS/cm at 25 °C	341	1	
Calcium	Extractable	mg/L	35	0.01	
Iron	Extractable	mg/L	<0.004	0.004	0.3
Magnesium	Extractable	mg/L	9.3	0.02	
Manganese	Extractable	mg/L	0.060	0.001	0.02 AO; 0.12 MAC
Potassium	Extractable	mg/L	3.1	0.04	
Silicon	Extractable	mg/L	7.4	0.005	
Sodium	Extractable	mg/L	20	0.1	200
T-Alkalinity	as CaCO3	mg/L	132	5	
Chloride	Dissolved	mg/L	15.9	0.05	250
Fluoride	Dissolved	mg/L	0.05	0.01	1.5
Nitrate - N	Dissolved	mg/L	0.03	0.01	10

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-1
Sample Date January 05, 2023
Sample Time 09:03
Sample Location
Sample Description RW 1-87/14 / 8.4°C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	22.5	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	126	1		
Total Dissolved Solids	Extractable	mg/L	205	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-2
Sample Date January 05, 2023
Sample Time 08:50
Sample Location
Sample Description RW 2-63/17 / 8.4°C
Sample Matrix Drinking Water

Sample Data			Nominal Detection Limit		Guideline Limit	Guideline Comments
Analyte		Units	Result			
Metals Extractable						
Aluminum	Extractable	mg/L	0.002	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00010	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0008	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.016	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.020	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00002	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00007	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	<0.0005	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	<0.00001	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0005	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.093	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00013	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00044	0.00005		
Zinc	Extractable	mg/L	0.0007	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	2.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	0.18	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH - Holding Time			Exceeded			
pH	at 25 °C		7.55	0.01	7.0-10.5	Within Range
Electrical Conductivity		µS/cm at 25 °C	280	1		
Calcium	Extractable	mg/L	31	0.01		
Iron	Extractable	mg/L	0.005	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	7.7	0.02		
Manganese	Extractable	mg/L	0.012	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	2.0	0.04		
Silicon	Extractable	mg/L	8.8	0.005		
Sodium	Extractable	mg/L	11	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	76	5		
Chloride	Dissolved	mg/L	23.8	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.03	0.01	1.5	Below MAC
Nitrate - N	Dissolved	mg/L	1.20	0.01	10	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-2
Sample Date January 05, 2023
Sample Time 08:50
Sample Location
Sample Description RW 2-63/17 / 8.4°C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	22.1	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	110	1		
Total Dissolved Solids	Extractable	mg/L	173	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-3
Sample Date January 05, 2023
Sample Time 09:15
Sample Location
Sample Description RW 3-93/11 / 8.4°C
Sample Matrix Drinking Water

Sample Data			Comparison Data		Guideline Data	
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00004	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0003	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.0099	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.013	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00003	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00015	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	0.0017	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00007	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0004	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.15	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00004	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00048	0.00005		
Zinc	Extractable	mg/L	0.0068	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	<2.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	<0.10	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH - Holding Time			Exceeded			
pH	at 25 °C		7.13	0.01	7.0-10.5	Within Range
Electrical Conductivity		µS/cm at 25 °C	361	1		
Calcium	Extractable	mg/L	39	0.01		
Iron	Extractable	mg/L	<0.004	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	9.4	0.02		
Manganese	Extractable	mg/L	<0.001	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	1.8	0.04		
Silicon	Extractable	mg/L	11	0.005		
Sodium	Extractable	mg/L	12	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	53	5		
Chloride	Dissolved	mg/L	61.5	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.02	0.01	1.5	Below MAC
Nitrate - N	Dissolved	mg/L	2.03	0.01	10	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-3
Sample Date January 05, 2023
Sample Time 09:15
Sample Location
Sample Description RW 3-93/11 / 8.4°C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	19.6	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	136	1		
Total Dissolved Solids	Extractable	mg/L	213	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number: 1624307-4
Sample Date: January 05, 2023
Sample Time: 09:33
Sample Location:
Sample Description: RW 7-00/13 / 8.4°C
Sample Matrix: Drinking Water

Sample Information			Sampling Data		Nominal Detection Limit	Guideline Limit	Guideline Comments
Analyte		Units	Result				
Metals Extractable							
Aluminum	Extractable	mg/L	0.001	0.001	0.1 OG; 2.9 MAC		Below OG
Antimony	Extractable	mg/L	0.00003	0.00002	0.006		Below MAC
Arsenic	Extractable	mg/L	0.0003	0.0001	0.010		Below MAC
Barium	Extractable	mg/L	0.0075	0.0001	2.0		Below MAC
Boron	Extractable	mg/L	0.011	0.002	5		Below MAC
Cadmium	Extractable	mg/L	0.00003	0.00001	0.007		Below MAC
Chromium	Extractable	mg/L	0.00026	0.00005	0.05		Below MAC
Copper	Extractable	mg/L	0.0026	0.0005	1 AO; 2 MAC		Below AO
Lead	Extractable	mg/L	0.00012	0.00001	0.005		Below MAC
Selenium	Extractable	mg/L	<0.0002	0.0002	0.05		Below MAC
Strontium	Extractable	mg/L	0.11	0.0001	7.0		Below MAC
Uranium	Extractable	mg/L	0.00002	0.00001	0.02		Below MAC
Vanadium	Extractable	mg/L	0.00049	0.00005			
Zinc	Extractable	mg/L	0.015	0.0005	5.0		Below AO
Microbiological Analysis							
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL		Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL		Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	33.0	2			
Physical and Aggregate Properties							
Colour	True	Colour units	<5	5			
Turbidity		NTU	0.20	0.1	0.1/0.3/1.0 OG		
Routine Water							
pH - Holding Time			Exceeded				
pH	at 25 °C		7.22	0.01	7.0-10.5		Within Range
Electrical Conductivity		µS/cm at 25 °C	257	1			
Calcium	Extractable	mg/L	27	0.01			
Iron	Extractable	mg/L	0.004	0.004	0.3		Below AO
Magnesium	Extractable	mg/L	6.3	0.02			
Manganese	Extractable	mg/L	0.012	0.001	0.02 AO; 0.12 MAC		Below AO
Potassium	Extractable	mg/L	1.4	0.04			
Silicon	Extractable	mg/L	10	0.005			
Sodium	Extractable	mg/L	8.6	0.1	200		Below AO
T-Alkalinity	as CaCO3	mg/L	41	5			
Chloride	Dissolved	mg/L	38.7	0.05	250		Below AO
Fluoride	Dissolved	mg/L	0.02	0.01	1.5		Below MAC
Nitrate - N	Dissolved	mg/L	2.50	0.01	10		Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-4
Sample Date January 05, 2023
Sample Time 09:33
Sample Location
Sample Description RW 7-00/13 / 8.4°C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	14.6	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	92	1		
Total Dissolved Solids	Extractable	mg/L	159	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number: 1624307-5
Sample Date: January 05, 2023
Sample Time: 10:36
Sample Location:
Sample Description: Reservoir "C" / 8.4°C
Sample Matrix: Drinking Water

Sample Data			Nominal Detection Limit		Guideline Limit	Guideline Comments
Analyte		Units	Result			
Metals Extractable						
Aluminum	Extractable	mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00008	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0007	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.014	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.017	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00001	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00013	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	<0.0005	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	<0.00001	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0004	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.11	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00009	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00051	0.00005		
Zinc	Extractable	mg/L	0.0006	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	<2.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	<0.10	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH - Holding Time			Exceeded			
pH	at 25 °C		7.50	0.01	7.0-10.5	Within Range
Electrical Conductivity		µS/cm at 25 °C	292	1		
Calcium	Extractable	mg/L	31	0.01		
Iron	Extractable	mg/L	0.005	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	7.5	0.02		
Manganese	Extractable	mg/L	0.005	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	1.9	0.04		
Silicon	Extractable	mg/L	9.6	0.005		
Sodium	Extractable	mg/L	11	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	64	5		
Chloride	Dissolved	mg/L	35.0	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.03	0.01	1.5	Below MAC
Nitrate - N	Dissolved	mg/L	1.80	0.01	10	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-5
Sample Date January 05, 2023
Sample Time 10:36
Sample Location
Sample Description Reservoir "C" / 8.4°C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	18.9	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	108	1		
Total Dissolved Solids	Extractable	mg/L	178	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
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Project ID:
Project Name:
Project Location:
LSD:
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Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-6
Sample Date January 05, 2023
Sample Time 09:48
Sample Location
Sample Description 32350 Diamond Cres / 8.4°C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00004	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0005	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.011	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.011	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00002	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00023	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	0.0024	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00083	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0002	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.11	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00002	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00045	0.00005		
Zinc	Extractable	mg/L	0.0033	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	4.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	<0.10	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH - Holding Time			Exceeded			
pH	at 25 °C		7.20	0.01	7.0-10.5	Within Range
Electrical Conductivity		µS/cm at 25 °C	264	1		
Calcium	Extractable	mg/L	28	0.01		
Iron	Extractable	mg/L	<0.004	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	6.4	0.02		
Manganese	Extractable	mg/L	0.003	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	1.5	0.04		
Silicon	Extractable	mg/L	10	0.005		
Sodium	Extractable	mg/L	9.0	0.1	200	Below AO
T-Alkalinity	as CaCO ₃	mg/L	45	5		
Chloride	Dissolved	mg/L	37.5	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.02	0.01	1.5	Below MAC
Nitrate - N	Dissolved	mg/L	2.46	0.01	10	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-6
Sample Date January 05, 2023
Sample Time 09:48
Sample Location
Sample Description 32350 Diamond Cres / 8.4°C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	14.8	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	97	1		
Total Dissolved Solids	Extractable	mg/L	163	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-7
Sample Date January 05, 2023
Sample Time 08:38
Sample Location
Sample Description 2464 Sunnyside PI / 8.4°C
Sample Matrix Drinking Water

Analyte			Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable							
Aluminum	Extractable	mg/L	0.001	0.001	0.1 OG; 2.9 MAC	Below OG	
Antimony	Extractable	mg/L	0.00009	0.00002	0.006	Below MAC	
Arsenic	Extractable	mg/L	0.0006	0.0001	0.010	Below MAC	
Barium	Extractable	mg/L	0.013	0.0001	2.0	Below MAC	
Boron	Extractable	mg/L	0.017	0.002	5	Below MAC	
Cadmium	Extractable	mg/L	<0.00001	0.00001	0.007	Below MAC	
Chromium	Extractable	mg/L	0.00014	0.00005	0.05	Below MAC	
Copper	Extractable	mg/L	0.013	0.0005	1 AO; 2 MAC	Below AO	
Lead	Extractable	mg/L	0.0013	0.00001	0.005	Below MAC	
Selenium	Extractable	mg/L	0.0006	0.0002	0.05	Below MAC	
Strontium	Extractable	mg/L	0.098	0.0001	7.0	Below MAC	
Uranium	Extractable	mg/L	0.00009	0.00001	0.02	Below MAC	
Vanadium	Extractable	mg/L	0.00051	0.00005			
Zinc	Extractable	mg/L	0.0041	0.0005	5.0	Below AO	
Microbiological Analysis							
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC	
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC	
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	8.0	2			
Physical and Aggregate Properties							
Colour	True	Colour units	<5	5			
Turbidity		NTU	0.11	0.1	0.1/0.3/1.0 OG		
Routine Water							
pH - Holding Time			Exceeded				
pH	at 25 °C		7.39	0.01	7.0-10.5	Within Range	
Electrical Conductivity		µS/cm at 25 °C	266	1			
Calcium	Extractable	mg/L	29	0.01			
Iron	Extractable	mg/L	0.004	0.004	0.3	Below AO	
Magnesium	Extractable	mg/L	7.0	0.02			
Manganese	Extractable	mg/L	0.002	0.001	0.02 AO; 0.12 MAC	Below AO	
Potassium	Extractable	mg/L	1.8	0.04			
Silicon	Extractable	mg/L	9.1	0.005			
Sodium	Extractable	mg/L	9.6	0.1	200	Below AO	
T-Alkalinity	as CaCO3	mg/L	67	5			
Chloride	Dissolved	mg/L	24.4	0.05	250	Below AO	
Fluoride	Dissolved	mg/L	0.03	0.01	1.5	Below MAC	
Nitrate - N	Dissolved	mg/L	1.48	0.01	10	Below MAC	

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1624307**
Control Number:
Date Received: Jan 5, 2023
Date Reported: Jan 10, 2023
Report Number: 2832325

Reference Number 1624307-7
Sample Date January 05, 2023
Sample Time 08:38
Sample Location
Sample Description 2464 Sunnyside PI / 8.4°C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	20.6	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	101	1		
Total Dissolved Solids	Extractable	mg/L	164	1	500	Below AO

Approved by:



Max Hewitt
Operations Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).

Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Methodology and Notes

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6	Project ID: Project Name: Project Location: LSD: P.O.:	Lot ID: 1624307 Control Number: Date Received: Jan 5, 2023 Date Reported: Jan 10, 2023 Report Number: 2832325
Attn: Accounts Payable	Proj. Acct. code:	
Sampled By:		
Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Alk, pH, EC, Turb in water (BC)	APHA	* Alkalinity - Titration Method, 2320 B	Jan 5, 2023	Element Vancouver
Alk, pH, EC, Turb in water (BC)	APHA	* Conductivity, 2510 B	Jan 5, 2023	Element Vancouver
Alk, pH, EC, Turb in water (BC)	APHA	* pH - Electrometric Method, 4500-H+ B	Jan 5, 2023	Element Vancouver
Anions by IEC in water (VAN)	APHA	* Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	Jan 5, 2023	Element Vancouver
Heterotrophic (Standard) Plate Count (Aerobic SP) - VAN	APHA	Enzyme Substrate Method, 9215 E	Jan 5, 2023	Element Vancouver
Metals SemiTrace (Extractable) in water (VAN)	US EPA	* Metals & Trace Elements by ICP-AES, 6010C	Jan 6, 2023	Element Vancouver
Total and E-Coli - Colilert - DW (VAN)	APHA	Enzyme Substrate Test, APHA 9223 B	Jan 5, 2023	Element Vancouver
Trace Metals (extractable) in Water (VAN)	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	Jan 6, 2023	Element Vancouver
True Color in water (VAN)	APHA	* Spectrophotometric - Single Wavelength Method, 2120 C	Jan 5, 2023	Element Vancouver
Turbidity - Water (VAN)	APHA	* Turbidity - Nephelometric Method, 2130 B	Jan 6, 2023	Element Vancouver

* Reference Method Modified

References

APHA	Standard Methods for the Examination of Water and Wastewater
US EPA	US Environmental Protection Agency Test Methods

Guidelines

Guideline Description	Health Canada GCDWQ
Guideline Source	Guidelines for Canadian Drinking Water Quality, Health Canada, Sept 2020
Guideline Comments	MAC = Maximum Acceptable Concentration AO = Aesthetic Objective OG = Operational Guideline for Water Treatment Plants (does not apply to private groundwater wells). Refer to Health Canada for complete guidelines at www.hc-sc.gc.ca

Comments:

- Jan 06, 2023 - Reduction of analytical volume was necessary for chloride analysis to bring results within the analytical range for lot 1624307. Detection limits are adjusted accordingly.

The comparison of test results to guideline limits is provided for information purposes only. This is not to be taken as a statement of conformance / nonconformance to any guideline, regulation or limit. The data user is responsible for all conclusions drawn with respect to the data and is advised to consult official regulatory references when evaluating compliance.

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

July 2023

Report Transmission Cover Page

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2889 Grandview Crescent
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V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Contact	Company	Address
Accounts Payable	Clearbrook Waterworks District	2889 Grandview Crescent Abbotsford, BC V2T 2R6 Phone: (604) 850-6621 Fax: (604) 850-7862 Email: office@clearbrookwaterworks.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge	PDF	COC / Invoice
Ineke Kalwij	Kalwij Water Dynamics Inc	P.O. Box 684 Station Main Port Coquitlam, BC V3B 6H9 Phone: (604) 615-4932 Fax: (604) 475-4062 Email: ineke@kalwijwaterdynamics.com
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Email	PDF	COC / Test Report
Email	Standard Crosstab Without Tabs	Test Report
Email - Merge	PDF	COA
Email - Merge	PDF	COA / COC
Ryan Federau	Clearbrook Waterworks District	2889 Grandview Crescent Abbotsford, BC V2T 2R6 Phone: (604) 309-3986 Fax: (604) 850-7862 Email: ryan@clearbrookwaterworks.com
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Analytical Report

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2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number 1666058-1
Sample Date July 18, 2023
Sample Time 10:51
Sample Location
Sample Description RW 1-87/14 / 6.7 °C
Sample Matrix Drinking Water

Sample Matrix			Drinking Water			
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00011	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0019	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.026	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.036	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00001	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	<0.00005	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	<0.0005	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	<0.00001	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	<0.0002	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.11	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00034	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00053	0.00005		
Zinc	Extractable	mg/L	<0.0005	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	<2.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	<0.10	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH - Holding Time			Exceeded			
pH	at 25 °C		7.58	0.01	7.0-10.5	Within Range
Electrical Conductivity		µS/cm at 25 °C	353	1		
Calcium	Extractable	mg/L	37	0.01		
Iron	Extractable	mg/L	<0.004	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	9.3	0.02		
Manganese	Extractable	mg/L	0.070	0.001	0.02 AO; 0.12 MAC	Above AO
Potassium	Extractable	mg/L	3.2	0.04		
Silicon	Extractable	mg/L	7.7	0.005		
Sodium	Extractable	mg/L	20	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	130	5		
Chloride	Dissolved	mg/L	16.1	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.04	0.01	1.5	Below MAC
Nitrate - N	Dissolved	mg/L	0.04	0.01	10	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number 1666058-1
Sample Date July 18, 2023
Sample Time 10:51
Sample Location
Sample Description RW 1-87/14 / 6.7 °C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	23.1	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	130	1		
Total Dissolved Solids	Extractable	mg/L	208	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number 1666058-2
Sample Date July 18, 2023
Sample Time 10:05
Sample Location
Sample Description RW 2-63/17 / 6.7 °C
Sample Matrix Drinking Water

Sample Data			Nominal Detection Limit		Guideline Limit	Guideline Comments
Analyte		Units	Result			
Metals Extractable						
Aluminum	Extractable	mg/L	0.008	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00010	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0009	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.016	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.022	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00001	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00033	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	<0.0005	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	<0.00001	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0005	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.100	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00012	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00046	0.00005		
Zinc	Extractable	mg/L	0.0007	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	<2.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	0.48	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH - Holding Time			Exceeded			
pH	at 25 °C		7.41	0.01	7.0-10.5	Within Range
Electrical Conductivity		µS/cm at 25 °C	287	1		
Calcium	Extractable	mg/L	31	0.01		
Iron	Extractable	mg/L	0.016	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	7.5	0.02		
Manganese	Extractable	mg/L	0.009	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	2.0	0.04		
Silicon	Extractable	mg/L	8.8	0.005		
Sodium	Extractable	mg/L	11	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	77	5		
Chloride	Dissolved	mg/L	22.9	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.03	0.01	1.5	Below MAC
Nitrate - N	Dissolved	mg/L	1.12	0.01	10	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number 1666058-2
Sample Date July 18, 2023
Sample Time 10:05
Sample Location
Sample Description RW 2-63/17 / 6.7 °C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	22.2	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	108	1		
Total Dissolved Solids	Extractable	mg/L	171	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
 2889 Grandview Crescent
 Abbotsford, BC, Canada
 V2T 2R6
 Attn: Accounts Payable
 Sampled By:
 Company:

Project ID:
 Project Name:
 Project Location:
 LSD:
 P.O.:
 Proj. Acct. code:

Lot ID: **1666058**
 Control Number:
 Date Received: Jul 18, 2023
 Date Reported: Jul 21, 2023
 Report Number: 2895128

Reference Number 1666058-3
Sample Date July 18, 2023
Sample Time 11:36
Sample Location
Sample Description RW 3-93/11 / 6.7 °C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00003	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0003	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.0080	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.014	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00003	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00021	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	0.0016	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00008	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0003	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.14	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00003	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00049	0.00005		
Zinc	Extractable	mg/L	0.0053	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	<2.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	0.38	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH - Holding Time			Exceeded			
pH	at 25 °C		7.00	0.01	7.0-10.5	Within Range
Electrical Conductivity		µS/cm at 25 °C	309	1		
Calcium	Extractable	mg/L	32	0.01		
Iron	Extractable	mg/L	0.006	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	7.6	0.02		
Manganese	Extractable	mg/L	0.001	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	1.7	0.04		
Silicon	Extractable	mg/L	10	0.005		
Sodium	Extractable	mg/L	11	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	48	5		
Chloride	Dissolved	mg/L	44.9	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.02	0.01	1.5	Below MAC
Nitrate - N	Dissolved	mg/L	2.33	0.01	10	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number 1666058-3
Sample Date July 18, 2023
Sample Time 11:36
Sample Location
Sample Description RW 3-93/11 / 6.7 °C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	16.1	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	111	1		
Total Dissolved Solids	Extractable	mg/L	181	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number: 1666058-4
Sample Date: July 18, 2023
Sample Time: 12:16
Sample Location:
Sample Description: RW 7-00/13 / 6.7 °C
Sample Matrix: Drinking Water

Sample Data			Sampling Date		Sampling Location	
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	0.002	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00003	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0003	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.0065	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.012	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00002	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00024	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	0.0027	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00013	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	<0.0002	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.11	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00002	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00050	0.00005		
Zinc	Extractable	mg/L	0.011	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	4.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	0.18	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH - Holding Time			Exceeded			
pH	at 25 °C		6.99	0.01	7.0-10.5	Below Range
Electrical Conductivity		µS/cm at 25 °C	240	1		
Calcium	Extractable	mg/L	24	0.01		
Iron	Extractable	mg/L	0.011	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	6.0	0.02		
Manganese	Extractable	mg/L	0.002	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	1.3	0.04		
Silicon	Extractable	mg/L	11	0.005		
Sodium	Extractable	mg/L	8.4	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	41	5		
Chloride	Dissolved	mg/L	30.6	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.02	0.01	1.5	Below MAC
Nitrate - N	Dissolved	mg/L	2.36	0.01	10	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number 1666058-4
Sample Date July 18, 2023
Sample Time 12:16
Sample Location
Sample Description RW 7-00/13 / 6.7 °C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	14.5	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	86	1		
Total Dissolved Solids	Extractable	mg/L	149	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number 1666058-5
Sample Date July 18, 2023
Sample Time 11:53
Sample Location
Sample Description 32350 Diamond Cres / 6.7 °C
Sample Matrix Drinking Water

Sample Data			Sampling Data		Nominal Detection Limit	Guideline Limit	Guideline Comments
Analyte		Units	Result				
Metals Extractable							
Aluminum	Extractable	mg/L	0.007	0.001	0.1 OG; 2.9 MAC		Below OG
Antimony	Extractable	mg/L	0.00008	0.00002	0.006		Below MAC
Arsenic	Extractable	mg/L	0.0008	0.0001	0.010		Below MAC
Barium	Extractable	mg/L	0.014	0.0001	2.0		Below MAC
Boron	Extractable	mg/L	0.020	0.002	5		Below MAC
Cadmium	Extractable	mg/L	<0.00001	0.00001	0.007		Below MAC
Chromium	Extractable	mg/L	0.00009	0.00005	0.05		Below MAC
Copper	Extractable	mg/L	0.0043	0.0005	1 AO; 2 MAC		Below AO
Lead	Extractable	mg/L	0.00077	0.00001	0.005		Below MAC
Selenium	Extractable	mg/L	0.0005	0.0002	0.05		Below MAC
Strontium	Extractable	mg/L	0.11	0.0001	7.0		Below MAC
Uranium	Extractable	mg/L	0.00009	0.00001	0.02		Below MAC
Vanadium	Extractable	mg/L	0.00049	0.00005			
Zinc	Extractable	mg/L	0.011	0.0005	5.0		Below AO
Microbiological Analysis							
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL		Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL		Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	59.0	2			
Physical and Aggregate Properties							
Colour	True	Colour units	<5	5			
Turbidity		NTU	0.21	0.1	0.1/0.3/1.0 OG		
Routine Water							
pH - Holding Time			Exceeded				
pH	at 25 °C		7.34	0.01	7.0-10.5		Within Range
Electrical Conductivity		µS/cm at 25 °C	285	1			
Calcium	Extractable	mg/L	31	0.01			
Iron	Extractable	mg/L	0.011	0.004	0.3		Below AO
Magnesium	Extractable	mg/L	7.0	0.02			
Manganese	Extractable	mg/L	0.002	0.001	0.02 AO; 0.12 MAC		Below AO
Potassium	Extractable	mg/L	1.8	0.04			
Silicon	Extractable	mg/L	9.4	0.005			
Sodium	Extractable	mg/L	10	0.1	200		Below AO
T-Alkalinity	as CaCO3	mg/L	71	5			
Chloride	Dissolved	mg/L	24.8	0.05	250		Below AO
Fluoride	Dissolved	mg/L	0.03	0.01	1.5		Below MAC
Nitrate - N	Dissolved	mg/L	1.34	0.01	10		Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number 1666058-5
Sample Date July 18, 2023
Sample Time 11:53
Sample Location
Sample Description 32350 Diamond Cres / 6.7 °C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	21.1	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	105	1		
Total Dissolved Solids	Extractable	mg/L	170	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number: 1666058-6
Sample Date: July 18, 2023
Sample Time: 12:03
Sample Location:
Sample Description: 2464 Sunnyside PI / 6.7 °C
Sample Matrix: Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	0.003	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00008	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0009	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.015	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.022	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00001	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00013	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	0.0024	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00066	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0004	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.11	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00011	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00056	0.00005		
Zinc	Extractable	mg/L	0.011	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	2.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	0.16	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH - Holding Time			Exceeded			
pH	at 25 °C		7.42	0.01	7.0-10.5	Within Range
Electrical Conductivity		µS/cm at 25 °C	294	1		
Calcium	Extractable	mg/L	32	0.01		
Iron	Extractable	mg/L	0.010	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	7.2	0.02		
Manganese	Extractable	mg/L	0.002	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	2.1	0.04		
Silicon	Extractable	mg/L	9.3	0.005		
Sodium	Extractable	mg/L	12	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	74	5		
Chloride	Dissolved	mg/L	26.8	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.03	0.01	1.5	Below MAC
Nitrate - N	Dissolved	mg/L	1.41	0.01	10	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666058**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 21, 2023
Report Number: 2895128

Reference Number 1666058-6
Sample Date July 18, 2023
Sample Time 12:03
Sample Location
Sample Description 2464 Sunnyside PI / 6.7 °C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	20.2	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	108	1		
Total Dissolved Solids	Extractable	mg/L	175	1	500	Below AO

Approved by:



Max Hewitt
Operations Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).

Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Methodology and Notes

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6	Project ID: Project Name: Project Location: LSD: P.O.:	Lot ID: 1666058 Control Number: Date Received: Jul 18, 2023 Date Reported: Jul 21, 2023 Report Number: 2895128
Attn: Accounts Payable	Proj. Acct. code:	
Sampled By:		
Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Alk, pH, EC, Turb in water (BC)	APHA	* Alkalinity - Titration Method, 2320 B	Jul 18, 2023	Element Vancouver
Alk, pH, EC, Turb in water (BC)	APHA	* Conductivity, 2510 B	Jul 18, 2023	Element Vancouver
Alk, pH, EC, Turb in water (BC)	APHA	* pH - Electrometric Method, 4500-H+ B	Jul 18, 2023	Element Vancouver
Anions by IEC in water (VAN)	APHA	* Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	Jul 18, 2023	Element Vancouver
Heterotrophic (Standard) Plate Count (Aerobic SP) - VAN	APHA	Enzyme Substrate Method, 9215 E	Jul 18, 2023	Element Vancouver
Metals SemiTrace (Extractable) in water (VAN)	US EPA	* Metals & Trace Elements by ICP-AES, 6010C	Jul 19, 2023	Element Vancouver
Total and E-Coli - Colilert - DW (VAN)	APHA	Enzyme Substrate Test, APHA 9223 B	Jul 18, 2023	Element Vancouver
Trace Metals (extractable) in Water (VAN)	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	Jul 19, 2023	Element Vancouver
True Color in water (VAN)	APHA	* Spectrophotometric - Single Wavelength Method, 2120 C	Jul 18, 2023	Element Vancouver
Turbidity - Water (VAN)	APHA	* Turbidity - Nephelometric Method, 2130 B	Jul 20, 2023	Element Vancouver

* Reference Method Modified

References

APHA	Standard Methods for the Examination of Water and Wastewater
US EPA	US Environmental Protection Agency Test Methods

Guidelines

Guideline Description	Health Canada GCDWQ
Guideline Source	Guidelines for Canadian Drinking Water Quality, Health Canada, Sept 2020
Guideline Comments	MAC = Maximum Acceptable Concentration AO = Aesthetic Objective OG = Operational Guideline for Water Treatment Plants (does not apply to private groundwater wells). Refer to Health Canada for complete guidelines at www.hc-sc.gc.ca

The comparison of test results to guideline limits is provided for information purposes only. This is not to be taken as a statement of conformance / nonconformance to any guideline, regulation or limit. The data user is responsible for all conclusions drawn with respect to the data and is advised to consult official regulatory references when evaluating compliance.

Please direct any inquiries regarding this report to our Client Services group.

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December 2023

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LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Contact	Company	Address
Accounts Payable	Clearbrook Waterworks District	2889 Grandview Crescent Abbotsford, BC V2T 2R6 Phone: (604) 850-6621 Fax: (604) 850-7862 Email: office@clearbrookwaterworks.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge	PDF	COC / Invoice
Ineke Kalwij	Kalwij Water Dynamics Inc	P.O. Box 684 Station Main Port Coquitlam, BC V3B 6H9 Phone: (604) 615-4932 Fax: (604) 475-4062 Email: ineke@kalwijwaterdynamics.com
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Email	Standard Crosstab Without Tabs	Test Report
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Email - Merge	PDF	COA / COC
Ryan Federau	Clearbrook Waterworks District	2889 Grandview Crescent Abbotsford, BC V2T 2R6 Phone: (604) 309-3986 Fax: (604) 850-7862 Email: ryan@clearbrookwaterworks.com
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Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number 1703100-1
Sample Date December 20, 2023
Sample Time 11:26
Sample Location
Sample Description RW 1-87/14 / 7.8 °C
Sample Matrix Drinking Water

Sample Matrix		Drinking Water		Nominal Detection	Guideline	Guideline
Analyte		Units	Result	Limit	Limit	Comments
Metals Extractable						
Aluminum	Extractable	mg/L	0.002	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00014	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0014	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.022	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.022	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00001	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00013	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	<0.0005	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	<0.00001	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0005	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.090	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00016	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	0.00018	0.00005		
Zinc	Extractable	mg/L	0.0044	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	177	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	0.14	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH			7.55	0.01	7.0-10.5	Within Range
pH - Holding Time			Exceeded			
Temp. of observed pH		°C	21.2			
Electrical Conductivity	at 25 °C	µS/cm	284	1		
Calcium	Extractable	mg/L	32	0.01		
Iron	Extractable	mg/L	0.005	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	8.1	0.02		
Manganese	Extractable	mg/L	0.072	0.001	0.02 AO; 0.12 MAC	Above AO
Potassium	Extractable	mg/L	2.6	0.04		
Silicon	Extractable	mg/L	8.8	0.005		
Sodium	Extractable	mg/L	13	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	93	5		
Chloride	Dissolved	mg/L	17.7	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.02	0.01	1.5	Below MAC

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Reference Number 1703100-1
Sample Date December 20, 2023
Sample Time 11:26
Sample Location
Sample Description RW 1-87/14 / 7.8 °C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrate - N	Dissolved	mg/L	0.83	0.01	10	Below MAC
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	23.0	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	112	1		
Total Dissolved Solids	Extractable	mg/L	179	1	500	Below AO

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Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number 1703100-2
Sample Date December 20, 2023
Sample Time 09:50
Sample Location
Sample Description RW 3-93/11 / 7.8 °C
Sample Matrix Drinking Water

Sample Data			Sampling Data		Guideline Data	
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00008	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0004	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.0085	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.010	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00007	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00020	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	0.0012	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00008	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0003	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.14	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00007	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	<0.00005	0.00005		
Zinc	Extractable	mg/L	0.0067	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	<2.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	<0.10	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH			7.09	0.01	7.0-10.5	Within Range
pH - Holding Time			Exceeded			
Temp. of observed pH		°C	21.5			
Electrical Conductivity	at 25 °C	µS/cm	331	1		
Calcium	Extractable	mg/L	35	0.01		
Iron	Extractable	mg/L	0.012	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	8.4	0.02		
Manganese	Extractable	mg/L	<0.001	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	1.8	0.04		
Silicon	Extractable	mg/L	10	0.005		
Sodium	Extractable	mg/L	12	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	48	5		
Chloride	Dissolved	mg/L	56.1	0.05	250	Below AO
Fluoride	Dissolved	mg/L	<0.01	0.01	1.5	Below MAC

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Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number 1703100-2
Sample Date December 20, 2023
Sample Time 09:50
Sample Location
Sample Description RW 3-93/11 / 7.8 °C
Sample Matrix Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued						
Nitrate - N	Dissolved	mg/L	2.24	0.01	10	Below MAC
Nitrite - N	Dissolved	mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved	mg/L	16.9	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable)	mg/L	122	1		
Total Dissolved Solids	Extractable	mg/L	197	1	500	Below AO

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Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number 1703100-3
Sample Date December 20, 2023
Sample Time 10:19
Sample Location
Sample Description RW 7-00/13 / 7.8 °C
Sample Matrix Drinking Water

Sample Data			Sampling Data		Guideline Data	
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00003	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0004	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.0065	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.010	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00003	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00030	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	0.0017	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00017	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0002	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.10	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00001	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	<0.00005	0.00005		
Zinc	Extractable	mg/L	0.017	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	4.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	<0.10	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH			6.97	0.01	7.0-10.5	Below Range
pH - Holding Time			Exceeded			
Temp. of observed pH		°C	21.5			
Electrical Conductivity	at 25 °C	µS/cm	248	1		
Calcium	Extractable	mg/L	26	0.01		
Iron	Extractable	mg/L	<0.004	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	6.4	0.02		
Manganese	Extractable	mg/L	0.001	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	1.4	0.04		
Silicon	Extractable	mg/L	11	0.005		
Sodium	Extractable	mg/L	9.0	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	40	5		
Chloride	Dissolved	mg/L	35.8	0.05	250	Below AO
Fluoride	Dissolved	mg/L	<0.01	0.01	1.5	Below MAC

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Date Received: Dec 20, 2023
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Reference Number 1703100-3
Sample Date December 20, 2023
Sample Time 10:19
Sample Location
Sample Description RW 7-00/13 / 7.8 °C
Sample Matrix Drinking Water

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued					
Nitrate - N	Dissolved mg/L	2.40	0.01	10	Below MAC
Nitrite - N	Dissolved mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved mg/L	14.6	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable) mg/L	90	1		
Total Dissolved Solids	Extractable mg/L	156	1	500	Below AO

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Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number: 1703100-4
Sample Date: December 20, 2023
Sample Time: 08:51
Sample Location:
Sample Description: Reservoir "C" / 7.8 °C
Sample Matrix: Drinking Water

Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00008	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0007	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.013	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.015	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00002	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00017	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	<0.0005	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00001	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0004	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.11	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00009	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	<0.00005	0.00005		
Zinc	Extractable	mg/L	0.0019	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	137	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	<0.10	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH			7.30	0.01	7.0-10.5	Within Range
pH - Holding Time			Exceeded			
Temp. of observed pH		°C	21.5			
Electrical Conductivity	at 25 °C	µS/cm	312	1		
Calcium	Extractable	mg/L	32	0.01		
Iron	Extractable	mg/L	0.008	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	7.9	0.02		
Manganese	Extractable	mg/L	0.008	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	2.0	0.04		
Silicon	Extractable	mg/L	9.8	0.005		
Sodium	Extractable	mg/L	12	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	67	5		
Chloride	Dissolved	mg/L	39.1	0.05	250	Below AO
Fluoride	Dissolved	mg/L	<0.01	0.01	1.5	Below MAC

Analytical Report

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Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number 1703100-4
Sample Date December 20, 2023
Sample Time 08:51
Sample Location
Sample Description Reservoir "C" / 7.8 °C
Sample Matrix Drinking Water

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued					
Nitrate - N	Dissolved mg/L	1.62	0.01	10	Below MAC
Nitrite - N	Dissolved mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved mg/L	19.8	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable) mg/L	114	1		
Total Dissolved Solids	Extractable mg/L	187	1	500	Below AO

Analytical Report

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Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number 1703100-5
Sample Date December 20, 2023
Sample Time 10:51
Sample Location
Sample Description 32350 Diamond Cres / 7.8 °C
Sample Matrix Drinking Water

Sample Data			Sampling Data		Guideline Data	
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00012	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0010	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.014	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.019	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00001	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00011	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	0.0026	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00030	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0005	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.099	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00015	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	<0.00005	0.00005		
Zinc	Extractable	mg/L	0.010	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	62.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	<0.10	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH			7.40	0.01	7.0-10.5	Within Range
pH - Holding Time			Exceeded			
Temp. of observed pH		°C	21.6			
Electrical Conductivity	at 25 °C	µS/cm	285	1		
Calcium	Extractable	mg/L	31	0.01		
Iron	Extractable	mg/L	<0.004	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	7.9	0.02		
Manganese	Extractable	mg/L	0.018	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	2.3	0.04		
Silicon	Extractable	mg/L	9.1	0.005		
Sodium	Extractable	mg/L	12	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	86	5		
Chloride	Dissolved	mg/L	21.2	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.02	0.01	1.5	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number 1703100-5
Sample Date December 20, 2023
Sample Time 10:51
Sample Location
Sample Description 32350 Diamond Cres / 7.8 °C
Sample Matrix Drinking Water

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued					
Nitrate - N	Dissolved mg/L	0.99	0.01	10	Below MAC
Nitrite - N	Dissolved mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved mg/L	22.6	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable) mg/L	111	1		
Total Dissolved Solids	Extractable mg/L	178	1	500	Below AO

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number: 1703100-6
Sample Date: December 20, 2023
Sample Time: 09:14
Sample Location:
Sample Description: 2464 Sunnyside Pl / 7.8 °C
Sample Matrix: Drinking Water

Sample Data			Sampling Data		Guideline Data	
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Extractable						
Aluminum	Extractable	mg/L	<0.001	0.001	0.1 OG; 2.9 MAC	Below OG
Antimony	Extractable	mg/L	0.00014	0.00002	0.006	Below MAC
Arsenic	Extractable	mg/L	0.0010	0.0001	0.010	Below MAC
Barium	Extractable	mg/L	0.014	0.0001	2.0	Below MAC
Boron	Extractable	mg/L	0.022	0.002	5	Below MAC
Cadmium	Extractable	mg/L	0.00001	0.00001	0.007	Below MAC
Chromium	Extractable	mg/L	0.00010	0.00005	0.05	Below MAC
Copper	Extractable	mg/L	0.0020	0.0005	1 AO; 2 MAC	Below AO
Lead	Extractable	mg/L	0.00030	0.00001	0.005	Below MAC
Selenium	Extractable	mg/L	0.0004	0.0002	0.05	Below MAC
Strontium	Extractable	mg/L	0.096	0.0001	7.0	Below MAC
Uranium	Extractable	mg/L	0.00016	0.00001	0.02	Below MAC
Vanadium	Extractable	mg/L	<0.00005	0.00005		
Zinc	Extractable	mg/L	0.018	0.0005	5.0	Below AO
Microbiological Analysis						
Total Coliforms	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Escherichia coli	Enzyme Substrate Test	MPN/100 mL	<1.0	1.0	0 per 100 mL	Below MAC
Heterotrophic Count - Aerobic	SimPlate	MPN/mL	53.0	2		
Physical and Aggregate Properties						
Colour	True	Colour units	<5	5		
Turbidity		NTU	<0.10	0.1	0.1/0.3/1.0 OG	
Routine Water						
pH			7.40	0.01	7.0-10.5	Within Range
pH - Holding Time			Exceeded			
Temp. of observed pH		°C	21.5			
Electrical Conductivity	at 25 °C	µS/cm	283	1		
Calcium	Extractable	mg/L	32	0.01		
Iron	Extractable	mg/L	<0.004	0.004	0.3	Below AO
Magnesium	Extractable	mg/L	8.1	0.02		
Manganese	Extractable	mg/L	0.011	0.001	0.02 AO; 0.12 MAC	Below AO
Potassium	Extractable	mg/L	2.4	0.04		
Silicon	Extractable	mg/L	8.9	0.005		
Sodium	Extractable	mg/L	13	0.1	200	Below AO
T-Alkalinity	as CaCO3	mg/L	91	5		
Chloride	Dissolved	mg/L	18.1	0.05	250	Below AO
Fluoride	Dissolved	mg/L	0.02	0.01	1.5	Below MAC

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID:
Project Name:
Project Location:
LSD:
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Proj. Acct. code:

Lot ID: **1703100**
Control Number:
Date Received: Dec 20, 2023
Date Reported: Dec 28, 2023
Report Number: 2957979

Reference Number 1703100-6
Sample Date December 20, 2023
Sample Time 09:14
Sample Location
Sample Description 2464 Sunnyside Pl / 7.8 °C
Sample Matrix Drinking Water

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continued					
Nitrate - N	Dissolved mg/L	0.86	0.01	10	Below MAC
Nitrite - N	Dissolved mg/L	<0.01	0.01	1	Below MAC
Sulfate (SO ₄)	Dissolved mg/L	23.3	0.1	500	Below AO
Hardness	as CaCO ₃ (extractable) mg/L	112	1		
Total Dissolved Solids	Extractable mg/L	179	1	500	Below AO

Approved by:



Max Hewitt
Operations Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).

Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Methodology and Notes

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6	Project ID: Project Name: Project Location: LSD: P.O.:	Lot ID: 1703100 Control Number: Date Received: Dec 20, 2023 Date Reported: Dec 28, 2023 Report Number: 2957979
Attn: Accounts Payable	Proj. Acct. code:	
Sampled By:		
Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Alk, pH, EC, Turb in water (BC)	APHA	* Alkalinity - Titration Method, 2320 B	Dec 27, 2023	Element Vancouver
Alk, pH, EC, Turb in water (BC)	APHA	* Conductivity, 2510 B	Dec 27, 2023	Element Vancouver
Alk, pH, EC, Turb in water (BC)	APHA	* pH - Electrometric Method, 4500-H+ B	Dec 27, 2023	Element Vancouver
Anions by IEC in water (VAN)	APHA	* Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	Dec 21, 2023	Element Vancouver
Heterotrophic (Standard) Plate Count (Aerobic SP) - VAN	APHA	Enzyme Substrate Method, 9215 E	Dec 20, 2023	Element Vancouver
Metals SemiTrace (Extractable) in water (VAN)	US EPA	* Metals & Trace Elements by ICP-AES, 6010C	Dec 21, 2023	Element Vancouver
Total and E-Coli - Colilert - DW (VAN)	APHA	Enzyme Substrate Test, APHA 9223 B	Dec 20, 2023	Element Vancouver
Trace Metals (extractable) in Water (VAN)	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	Dec 21, 2023	Element Vancouver
True Color in water (VAN)	APHA	* Spectrophotometric - Single Wavelength Method, 2120 C	Dec 21, 2023	Element Vancouver
Turbidity - Water (VAN)	APHA	* Turbidity - Nephelometric Method, 2130 B	Dec 21, 2023	Element Vancouver

* Reference Method Modified

References

APHA	Standard Methods for the Examination of Water and Wastewater
US EPA	US Environmental Protection Agency Test Methods

Guidelines

Guideline Description	Health Canada GCDWQ
Guideline Source	Guidelines for Canadian Drinking Water Quality, Health Canada, Sept 2020
Guideline Comments	MAC = Maximum Acceptable Concentration AO = Aesthetic Objective OG = Operational Guideline for Water Treatment Plants (does not apply to private groundwater wells). Refer to Health Canada for complete guidelines at www.hc-sc.gc.ca

The comparison of test results to guideline limits is provided for information purposes only. This is not to be taken as a statement of conformance / nonconformance to any guideline, regulation or limit. The data user is responsible for all conclusions drawn with respect to the data and is advised to consult official regulatory references when evaluating compliance.

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

Appendix E

Water Quality Report – Comprehensive Water Quality Analysis (Element)

Report Transmission Cover Page

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6	Project ID: RW2-63/17 Project Name: Raw Groundwater Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1666050 Control Number: Date Received: Jul 18, 2023 Date Reported: Jul 31, 2023 Report Number: 2895123
Attn: Accounts Payable Sampled By: Company:		

Contact	Company	Address
Accounts Payable	Clearbrook Waterworks District	2889 Grandview Crescent Abbotsford, BC V2T 2R6 Phone: (604) 850-6621 Fax: (604) 850-7862 Email: office@clearbrookwaterworks.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge	PDF	COC / Invoice
Ineke Kalwij	Kalwij Water Dynamics Inc	P.O. Box 684 Station Main Port Coquitlam, BC V3B 6H9 Phone: (604) 615-4932 Fax: (604) 475-4062 Email: ineke@kalwijwaterdynamics.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email	PDF	COC / Test Report
Email	Standard Crosstab Without Tabs	Test Report
Email - Merge	PDF	COA
Email - Merge	PDF	COA / COC
Ryan Federau	Clearbrook Waterworks District	2889 Grandview Crescent Abbotsford, BC V2T 2R6 Phone: (604) 309-3986 Fax: (604) 850-7862 Email: ryan@clearbrookwaterworks.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge	PDF	COA / COC
Email - Merge	PDF	COC / Test Report

Notes To Clients:

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Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID: RW2-63/17
Project Name: Raw Groundwater
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666050**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 31, 2023
Report Number: 2895123

Reference Number 1666050-1
Sample Date Jul 18, 2023
Sample Time 10:09
Sample Location
Sample Description RW2-63-17 / Raw
Groundwater

Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Metals Total					
Calcium	Total	mg/L	32		0.01
Magnesium	Total	mg/L	7.8		0.02
Potassium	Total	mg/L	2.2		0.04
Silicon	Total	mg/L	9.2		0.005
Sulfur	Total	mg/L	7.9		0.02
Sodium	Total	mg/L	11		0.1
Titanium	Total	mg/L	0.006		0.002
Digestion	Preparation		Field Pres, digest as total Hg		
Mercury	Total	mg/L	<0.00001		0.00001
Polycyclic Aromatic Hydrocarbons - Water					
Acenaphthene		µg/L	<0.1		0.1
Acenaphthylene		µg/L	<0.1		0.1
Acridine		µg/L	<0.05		0.05
Anthracene		µg/L	<0.1		0.1
Benzo(a)anthracene		µg/L	<0.01		0.01
Benzo(a)pyrene		µg/L	<0.01		0.01
Benzo(b)fluoranthene		µg/L	<0.01		0.01
Benzo(b+j)fluoranthene		µg/L	<0.04		0.02
Benzo(g,h,i)perylene		µg/L	<0.1		0.1
Benzo(k)fluoranthene		µg/L	<0.02		0.02
Chrysene		µg/L	<0.1		0.1
Dibenzo(a,h)anthracene		µg/L	<0.01		0.01
Fluorene		µg/L	<0.1		0.1
Indeno(1,2,3-c,d)pyrene		µg/L	<0.1		0.1
1-Methylnaphthalene		µg/L	<0.1		0.1
2-Methylnaphthalene		µg/L	<0.1		0.1
Naphthalene		µg/L	<0.1		0.1
Phenanthrene		µg/L	<0.1		0.1
Pyrene		µg/L	<0.02		0.02
Quinoline		µg/L	<0.02		0.02
PAH - Water - Surrogate Recovery					
2-Fluorobiphenyl	PAH - Surrogate	%	80.8		50-140
Naphthalene-d8	PAH - Surrogate	%	76.3		50-140
Quinoline-d7	PAH - Surrogate	%	101		50-140
p-Terphenyl-d14	PAH - Surrogate	%	118		50-140
Chlorinated Hydrocarbon Screen - Water					
Pentachloroethane		µg/L	<0.1		0.1
1,3-Dichlorobenzene		µg/L	<0.1		0.1

Analytical Report

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6 Attn: Accounts Payable Sampled By: Company:	Project ID: RW2-63/17 Project Name: Raw Groundwater Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1666050 Control Number: Date Received: Jul 18, 2023 Date Reported: Jul 31, 2023 Report Number: 2895123
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Reference Number	1666050-1
Sample Date	Jul 18, 2023
Sample Time	10:09
Sample Location	
Sample Description	RW2-63-17 / Raw Groundwater

Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Chlorinated Hydrocarbon Screen - Water - Continued					
1,4-Dichlorobenzene	µg/L	<0.1			0.1
1,2-Dichlorobenzene	µg/L	<0.1			0.1
Hexachloroethane	µg/L	<0.1			0.1
1,2,4-Trichlorobenzene	µg/L	<0.1			0.1
Hexachlorobutadiene	µg/L	<0.1			0.1
Hexachloropropene	µg/L	<0.1			0.1
1,2,4,5-Tetrachlorobenzene	µg/L	<0.1			0.1
Hexachlorocyclopentadiene	µg/L	<0.1			0.1
2-Chloronaphthalene	µg/L	<0.1			0.1
Pentachlorobenzene	µg/L	<0.1			0.1
Hexachlorobenzene	µg/L	<0.1			0.1
Total	µg/L	<0.1			0.1
Chlorinated Hydrocarbon - Water - Surrogates					
Nitrobenzene-d5	Surrogate	%	84		50-140
2-Fluorobiphenyl	Surrogate	%	65		50-140
4-Terphenyl-d14	Surrogate	%	71		50-140
Haloacetic Acids - Water					
Monochloroacetic Acid	µg/L	<2.0			2.0
Monobromoacetic Acid	µg/L	<2.0			2.0
Dichloroacetic Acid	µg/L	<2.0			2.0
Trichloroacetic Acid	µg/L	<2.0			2.0
Bromochloroacetic Acid	µg/L	<2.0			2.0
Dibromoacetic Acid	µg/L	<2.0			2.0
Total Haloacetic Acids (HAA6)	µg/L	<12.0			12.0
2,3-Dibromopropionic acid	%	55			50-150
VOC Screen - Water					
Acetone	µg/L	<10.0			10
Acetonitrile	µg/L	<5.0			5
Acrylonitrile	µg/L	<5.0			5
Allyl Chloride	µg/L	<5.0			5.0
Bromobenzene	µg/L	<0.5			0.5
Bromochloromethane	µg/L	<1.0			1
Bromodichloromethane	µg/L	<0.5			0.5
Bromoform	µg/L	<0.5			0.5
Bromomethane	µg/L	<1.0			1
1,3-Butadiene	µg/L	<1.0			1.0
n-Butylbenzene	µg/L	<0.5			0.5
sec-Butylbenzene	µg/L	<0.5			0.5

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID: RW2-63/17
Project Name: Raw Groundwater
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666050**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 31, 2023
Report Number: 2895123

Reference Number 1666050-1
Sample Date Jul 18, 2023
Sample Time 10:09
Sample Location
Sample Description RW2-63-17 / Raw
Groundwater

Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
VOC Screen - Water - Continued					
tert-Butylbenzene	µg/L	<0.5			0.5
Carbon Disulfide	µg/L	<2.0			2
Carbon Tetrachloride	µg/L	<0.5			0.50
Chlorobenzene	µg/L	<1.0			0.5
Chloroethane	µg/L	<10.0			10
2-Chloroethyl Vinyl Ether	µg/L	<1.0			1
Chloroform	µg/L	<0.5			0.5
Chloromethane	µg/L	<10.0			10
2-Chlorotoluene	µg/L	<0.5			0.5
4-Chlorotoluene	µg/L	<0.5			0.5
Dibromochloromethane	µg/L	<0.5			0.5
1,2-Dibromo-3-Chloropropane	µg/L	<0.5			0.5
1,2-Dibromoethane	µg/L	<0.5			0.5
Dibromomethane	µg/L	<0.5			0.5
1,4-Dichloro-2-Butene(cis)	µg/L	<25.0			25
1,4-Dichloro-2-Butene(trans)	µg/L	<25.0			25
1,2-Dichlorobenzene	µg/L	<0.5			0.5
1,3-Dichlorobenzene	µg/L	<1.0			0.5
1,4-Dichlorobenzene	µg/L	<0.5			0.5
1,1-Dichloroethane	µg/L	<0.5			0.5
1,2-Dichloroethane	µg/L	<0.5			0.5
1,1-Dichloroethylene	µg/L	<0.5			0.5
1,2-Dichloroethylene(cis)	µg/L	<0.5			0.5
1,2-Dichloroethylene(trans)	µg/L	<0.5			0.5
Dichlorodifluoromethane	µg/L	<1.0			1
Dichloromethane	µg/L	<5			2
1,2-Dichloropropane	µg/L	<0.5			0.5
1,3-Dichloropropane	µg/L	<0.5			0.5
2,2-Dichloropropane	µg/L	<10.0			10
1,1-Dichloropropene	µg/L	<1.0			1
1,3-Dichloropropene(cis)	µg/L	<0.5			0.5
1,3-Dichloropropene(trans)	µg/L	<0.5			0.5
Ethyl Methacrylate	µg/L	<25.0			25
Hexachlorobutadiene	µg/L	<2.0			2.0
Hexachloroethane	µg/L	<2.0			2
2-Hexanone	µg/L	<5.0			5
Iodomethane	µg/L	<10.0			10

Analytical Report

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6 Attn: Accounts Payable Sampled By: Company:	Project ID: RW2-63/17 Project Name: Raw Groundwater Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1666050 Control Number: Date Received: Jul 18, 2023 Date Reported: Jul 31, 2023 Report Number: 2895123
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Reference Number 1666050-1
Sample Date Jul 18, 2023
Sample Time 10:09
Sample Location
Sample Description RW2-63-17 / Raw Groundwater

Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
VOC Screen - Water - Continued					
p-Isopropyltoluene	µg/L	<5.0			5
Methacrylonitrile	µg/L	<5.0			5
Methylcyclohexane	µg/L	<0.5			0.5
Methyl Methacrylate	µg/L	<5.0			5.0
4-Methyl-2-Pentanone (MIBK)	µg/L	<25.0			25
Naphthalene	µg/L	<5.0			5
Propionitrile	µg/L	<25.0			25
iso-Propylbenzene	µg/L	<1.0			0.5
1-Propylbenzene	µg/L	<0.5			0.5
1,1,1,2-Tetrachloroethane	µg/L	<0.5			0.5
1,1,2,2-Tetrachloroethane	µg/L	<0.5			0.5
Tetrachloroethylene	µg/L	<0.5			0.5
1,2,3-Trichlorobenzene	µg/L	<1.0			1
1,2,4-Trichlorobenzene	µg/L	<1.0			1
1,1,1-Trichloroethane	µg/L	<0.5			0.5
1,1,2-Trichloroethane	µg/L	<0.5			0.5
1,3,5-Trichlorobenzene	µg/L	<0.5			0.5
Trichloroethylene	µg/L	<0.5			0.5
Trichlorofluoromethane	µg/L	<1.0			1
1,2,3-Trichloropropane	µg/L	<0.5			0.5
1,2,4-Trimethylbenzene	µg/L	<1.0			1
1,3,5-Trimethylbenzene	µg/L	<1.0			1
Vinyl Acetate	µg/L	<1.0			1
Vinyl Chloride	µg/L	<1.0			1.0
Methyl Ethyl Ketone (MEK)	µg/L	<25.0			5
Total Trihalomethanes	µg/L	<2.0			
VOC - Water - Surrogate Recovery					
Bromofluorobenzene EPA Surrogate	%	103			50-140
Dibromofluoromethane EPA Surrogate	%	98			50-140
Toluene-d8 EPA Surrogate	%	106			50-140
Multiresidue Pesticides in Water					
Bifentox	µg/L	<0.5			0.5
Carboxin	µg/L	<0.5			0.5
Deltamethrin	µg/L	<0.5			0.5
Fenamiphos	µg/L	<0.5			0.5
Fenvalerate	µg/L	<0.5			0.5
Methoprene	µg/L	<0.5			0.5
Norflurazon	µg/L	<0.5			0.5

Analytical Report

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6 Attn: Accounts Payable Sampled By: Company:	Project ID: RW2-63/17 Project Name: Raw Groundwater Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1666050 Control Number: Date Received: Jul 18, 2023 Date Reported: Jul 31, 2023 Report Number: 2895123
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Reference Number	1666050-1
Sample Date	Jul 18, 2023
Sample Time	10:09
Sample Location	
Sample Description	RW2-63-17 / Raw Groundwater

Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Multiresidue Pesticides in Water - Continued					
Pebulate	µg/L	<0.5			0.5
Prometon	µg/L	<0.5			0.5
Propargite	µg/L	<0.5			0.5
Propiconazole	µg/L	<0.5			0.5
Terbacil	µg/L	<0.5			0.5
Vernolate	µg/L	<0.5			0.5
Multiresidue Pesticides - Water - Surrogate Rec.					
TPP Surrogate	%	93			50-140
Organochlorine Pesticides in Water					
Aldrin	µg/L	<0.5			0.5
BHC (alpha isomer)	µg/L	<0.5			0.5
BHC (beta isomer)	µg/L	<0.5			0.5
BHC (delta isomer)	µg/L	<0.5			0.5
Captan	µg/L	<3.0			3.0
Chlorbendide	µg/L	<0.5			0.5
Chlordane-cis	µg/L	<0.5			0.5
Chlordane-trans	µg/L	<0.5			0.5
Chlorfenson	µg/L	<0.5			0.5
Chlorothalonil	µg/L	<0.5			0.5
Chlorthal-dimethyl	µg/L	<0.5			0.5
DDD-o,p'	µg/L	<0.5			0.5
DDD-p,p'	µg/L	<0.5			0.5
DDE-o,p'	µg/L	<0.5			0.5
DDE-p,p'	µg/L	<0.5			0.5
DDT-o,p'	µg/L	<0.5			0.5
DDT-p,p'	µg/L	<0.5			0.5
Dichlofluanid	µg/L	<0.5			0.5
Dieldrin	µg/L	<0.5			0.5
Endosulfan I	µg/L	<0.5			0.5
Endosulfan II	µg/L	<0.5			0.5
Endosulfan sulfate	µg/L	<0.5			0.5
Endrin	µg/L	<0.5			0.5
Folpet	µg/L	<3.0			3.0
Heptachlor	µg/L	<0.5			0.5
Heptachlor Epoxide	µg/L	<0.5			0.5
Hexachlorobenzene	µg/L	<0.5			0.5
Lindane	µg/L	<0.5			0.5
Methoxychlor	µg/L	<0.5			0.5

Analytical Report

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6 Attn: Accounts Payable Sampled By: Company:	Project ID: RW2-63/17 Project Name: Raw Groundwater Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1666050 Control Number: Date Received: Jul 18, 2023 Date Reported: Jul 31, 2023 Report Number: 2895123
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Reference Number	1666050-1
Sample Date	Jul 18, 2023
Sample Time	10:09
Sample Location	
Sample Description	RW2-63-17 / Raw Groundwater

Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Organochlorine Pesticides in Water - Continued					
Mirex	µg/L	<0.5			0.5
Permethrin-cis	µg/L	<0.5			0.5
Permethrin-trans	µg/L	<0.5			0.5
Procymidone	µg/L	<0.5			0.5
Propachlor	µg/L	<0.5			0.5
Quintozone	µg/L	<0.5			0.5
Tecnazene	µg/L	<0.5			0.5
Tetradifon	µg/L	<0.5			0.5
Tolyfluand	µg/L	<0.5			0.5
Triadimefon	µg/L	<0.5			0.5
Vinclozolin	µg/L	<0.5			0.5
Organochlorine Pesticides -Water- Surrogate Rec.					
TPP Surrogate	%	93			50-140
Organophosphate Pesticides in Water					
Aspon	µg/L	<0.5			0.5
Azinphos-ethyl	µg/L	<0.5			0.5
Azinphos-methyl	µg/L	<0.5			0.5
Bromophos	µg/L	<0.5			0.5
Bromophos-ethyl	µg/L	<0.5			0.5
Carbophenothion	µg/L	<0.5			0.5
Chlorfenvinphos	µg/L	<0.5			0.5
Chlormephos	µg/L	<0.5			0.5
Chlorpyrifos	µg/L	<0.5			0.5
Chlorpyrifos-methyl	µg/L	<0.5			0.5
Chlorthiophos	µg/L	<0.5			0.5
Cyanophos	µg/L	<0.5			0.5
Demeton	µg/L	<0.5			0.5
Diazinon	µg/L	<0.10			0.10
Dichlofenthion	µg/L	<0.5			0.5
Dimethoate	µg/L	<0.5			0.5
Disulfoton	µg/L	<0.5			0.5
Ethion	µg/L	<0.5			0.5
Fenchlorphos	µg/L	<0.5			0.5
Fenitrothion	µg/L	<0.5			0.5
Fenthion	µg/L	<0.5			0.5
Fonofos	µg/L	<0.5			0.5
Isofenphos	µg/L	<0.5			0.5
Malaoxon	µg/L	<0.5			0.5

Analytical Report

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6 Attn: Accounts Payable Sampled By: Company:	Project ID: RW2-63/17 Project Name: Raw Groundwater Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1666050 Control Number: Date Received: Jul 18, 2023 Date Reported: Jul 31, 2023 Report Number: 2895123
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Reference Number	1666050-1
Sample Date	Jul 18, 2023
Sample Time	10:09
Sample Location	
Sample Description	RW2-63-17 / Raw Groundwater

Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Organophosphate Pesticides in Water - Continued					
Malathion	µg/L	<0.1			0.1
Methyl Parathion	µg/L	<0.5			0.5
Mevinphos	µg/L	<0.5			0.5
Parathion	µg/L	<0.5			0.5
Phorate	µg/L	<0.5			0.5
Phosalone	µg/L	<0.5			0.5
Phosmet	µg/L	<0.5			0.5
Phosphamidon	µg/L	<0.5			0.5
Pirimiphos-ethyl	µg/L	<0.5			0.5
Pirimiphos-methyl	µg/L	<0.5			0.5
Pyrazophos	µg/L	<0.5			0.5
Quinalophos	µg/L	<0.5			0.5
Sulfotep	µg/L	<0.5			0.5
Terbufos	µg/L	<0.5			0.5
Tetrachlorvinphos	µg/L	<0.5			0.5
Organophosphate Pesticides -Water- Surrogate Rec.					
TPP	Surrogate %	93			50-140
Neutral Herbicides in Water					
Alachlor	µg/L	<0.5			0.5
Benfluralin	µg/L	<0.5			0.5
Butylate	µg/L	<0.5			0.5
Chlorpropham	µg/L	<0.5			0.5
Diallate	µg/L	<0.5			0.5
Dichlobenil	µg/L	<0.5			0.5
Diclofop-methyl	µg/L	<0.1			0.1
Diphenylamine	µg/L	<0.5			0.5
Eptam (EPTC)	µg/L	<0.5			0.5
Ethalfuralin	µg/L	<0.5			0.5
Fenoxaprop-ethyl	µg/L	<0.5			0.5
Fluazifop-p-butyl	µg/L	<0.5			0.5
Hexazinone	µg/L	<0.5			0.5
Metalaxyl	µg/L	<0.5			0.5
Metolachlor	µg/L	<0.5			0.5
Metribuzin	µg/L	<0.5			0.5
Pirimicarb	µg/L	<0.5			0.5
Profluralin	µg/L	<0.5			0.5
Prometryn	µg/L	<0.5			0.5
Propazine	µg/L	<0.5			0.5

Analytical Report

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6 Attn: Accounts Payable Sampled By: Company:	Project ID: RW2-63/17 Project Name: Raw Groundwater Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1666050 Control Number: Date Received: Jul 18, 2023 Date Reported: Jul 31, 2023 Report Number: 2895123
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Reference Number	1666050-1
Sample Date	Jul 18, 2023
Sample Time	10:09
Sample Location	
Sample Description	RW2-63-17 / Raw Groundwater

Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Neutral Herbicides in Water - Continued					
Propyzamide	µg/L	<0.5			0.5
Quizalofop-ethyl	µg/L	<0.5			0.5
Simetryn	µg/L	<0.5			0.5
Terbuthylazine	µg/L	<0.5			0.5
Terbutryn	µg/L	<0.5			0.5
Triallate	µg/L	<0.10			0.10
Trifluralin	µg/L	<0.1			0.1
Neutral Herbicides - Water - Surrogate Recovery					
TPP	Surrogate %	93			50-140
Carbamates in Water					
3-Hydroxycarbofuran	µg/L	<0.1			0.1
Aldicarb	µg/L	<0.1			0.1
Aldicarb sulfone	µg/L	<0.1			0.1
Aldicarb sulfoxide	µg/L	<0.1			0.1
Bendiocarb	µg/L	<0.1			0.1
BPMC	µg/L	<0.1			0.1
Carbaryl	µg/L	<0.1			0.1
Carbofuran	µg/L	<0.1			0.1
Imidacloprid	µg/L	<0.1			0.1
Methiocarb	µg/L	<0.1			0.1
Methomyl	µg/L	<0.1			0.1
Oxamyl	µg/L	<0.1			0.1
Promecarb	µg/L	<0.1			0.1
Propoxur	µg/L	<0.1			0.1
Carbamates in Water - Surrogate Recovery					
BDMC	Surrogate %	99.7			50-140
Acid Herbicides in Water					
2,4,5-T	µg/L	<0.1			0.1
2,4,5-TP	µg/L	<0.1			0.1
2,4-D	µg/L	<0.1			0.1
2,4-DB	µg/L	<0.1			0.1
Bromoxynil	µg/L	<0.1			0.1
Clopyralid	µg/L	<0.1			0.1
Dicamba	µg/L	<0.1			0.1
Dichlorprop	µg/L	<0.1			0.1
Dinoseb	µg/L	<0.1			0.1
Imazamox	µg/L	<0.1			0.1
Imazapyr	µg/L	<0.1			0.1

Analytical Report

Bill To: Clearbrook Waterworks District
2889 Grandview Crescent
Abbotsford, BC, Canada
V2T 2R6
Attn: Accounts Payable
Sampled By:
Company:

Project ID: RW2-63/17
Project Name: Raw Groundwater
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1666050**
Control Number:
Date Received: Jul 18, 2023
Date Reported: Jul 31, 2023
Report Number: 2895123

Reference Number 1666050-1
Sample Date Jul 18, 2023
Sample Time 10:09
Sample Location
Sample Description RW2-63-17 / Raw
Groundwater

Matrix Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Acid Herbicides in Water - Continued					
Imazethapyr	µg/L	<0.1			0.1
MCPA	µg/L	<0.1			0.1
MCPB	µg/L	<0.1			0.1
Mecoprop	µg/L	<0.1			0.1
Picloram	µg/L	<0.1			0.1
Triclopyr	µg/L	<0.1			0.1
Acid Herbicides - Water - Surrogate Recovery					
3,5-DCBA	Surrogate	%	81		50-140
Trace Metals Total					
Aluminum	Total	mg/L	0.018		0.001
Antimony	Total	mg/L	0.00012		0.00002
Arsenic	Total	mg/L	0.0008		0.0001
Barium	Total	mg/L	0.029		0.0001
Beryllium	Total	mg/L	<0.00005		0.00005
Bismuth	Total	mg/L	<0.0001		0.0001
Boron	Total	mg/L	0.019		0.002
Cadmium	Total	mg/L	0.00001		0.00001
Chromium	Total	mg/L	0.00054		0.00005
Cobalt	Total	mg/L	0.00003		0.00002
Copper	Total	mg/L	0.0003		0.0002
Iron	Total	mg/L	0.036		0.002
Lead	Total	mg/L	0.00002		0.00001
Lithium	Total	mg/L	0.0015		0.0005
Manganese	Total	mg/L	0.010		0.001
Molybdenum	Total	mg/L	0.00070		0.00002
Nickel	Total	mg/L	0.0006		0.0002
Selenium	Total	mg/L	0.0005		0.0002
Silver	Total	mg/L	<0.00001		0.00001
Strontium	Total	mg/L	0.11		0.0001
Tellurium	Total	mg/L	<0.00005		0.00005
Thallium	Total	mg/L	<0.00001		0.00001
Thorium	Total	mg/L	<0.00005		0.00005
Tin	Total	mg/L	<0.0001		0.0001
Uranium	Total	mg/L	0.00013		0.00001
Vanadium	Total	mg/L	0.00055		0.00005
Zinc	Total	mg/L	0.050		0.0005
Zirconium	Total	mg/L	<0.0001		0.0001

Analytical Report

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6 Attn: Accounts Payable Sampled By: Company:	Project ID: RW2-63/17 Project Name: Raw Groundwater Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1666050 Control Number: Date Received: Jul 18, 2023 Date Reported: Jul 31, 2023 Report Number: 2895123
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Reference Number	1666050-1
Sample Date	Jul 18, 2023
Sample Time	10:09
Sample Location	
Sample Description	RW2-63-17 / Raw Groundwater
Matrix	Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Subcontracted Analysis					
Nitritotriacetic Acid	mg/L	<0.1			0.1

Approved by:

Max Hewitt
Operations Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).

Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Methodology and Notes

Bill To: Clearbrook Waterworks District 2889 Grandview Crescent Abbotsford, BC, Canada V2T 2R6	Project ID: RW2-63/17	Lot ID: 1666050
Attn: Accounts Payable	Project Name: Raw Groundwater	Control Number:
Sampled By:	Project Location:	Date Received: Jul 18, 2023
Company:	LSD:	Date Reported: Jul 31, 2023
	P.O.:	Report Number: 2895123
	Proj. Acct. code:	

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Acid Herbicides - Water	US EPA	* US-EPA 8321B, 8321B	Jul 24, 2023	Element Calgary
Acid Herbicides - Water	USGS	* Determination of Pesticides in Water by Graphitized Carbon-Based SPE & HPLC/MS, O-2060-1	Jul 24, 2023	Element Calgary
Carbamates - Water	US EPA	* N-methylcarbamates by High Performance Liquid Chromatography (HPLC), 8318	Jul 24, 2023	Element Calgary
CHHY - Water	US EPA	* Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry, 8270	Jul 24, 2023	Element Calgary
FV2 Pesticides - Water	JAOAC	* Multi-Res Determination of Pesticides in FV by GC-MSD & LC, vol78	Jul 26, 2023	Element Calgary
FV2 Pesticides - Water	US EPA	* OC Pesticides by Gas Chromatography, 8081B	Jul 26, 2023	Element Calgary
Haloacetic Acids - Water	US EPA	* Determination of Haloacetic Acids and Dalapon in drinking water by liquid-liquid microextraction, derivatization, and gas chromatography with electron capture detection, 552.3	Jul 21, 2023	Element Calgary
Mercury Low Level (Total) in water (VAN)	EPA	* Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	Jul 21, 2023	Element Vancouver
Metals SemiTrace (Total) in Water (VAN)	US EPA	* Metals & Trace Elements by ICP-AES, 6010C	Jul 19, 2023	Element Vancouver
Neutral Herbicides - Water	US EPA	* OC Pesticides by Gas Chromatography, 8081B	Jul 26, 2023	Element Calgary
Nitrilotriacetic acid in water	Ext. Lab	Analysis performed by external laboratory, .	Jul 26, 2023	Saskatchewan Research Council
Organochlorine Pesticides - Water	US EPA	* OC Pesticides by Gas Chromatography, 8081B	Jul 22, 2023	Element Calgary
Organophosphate Pesticides - Water	US EPA	* OP Compounds by GC: Capillary Column Technique, 8141B	Jul 26, 2023	Element Calgary
PAH - Water (VAN)	BCELM	* Polycyclic Aromatic Hydrocarbons in Water by GC/MS - PBM, PAH Water	Jul 19, 2023	Element Vancouver
Trace Metals (Total) in Water (VAN)	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	Jul 19, 2023	Element Vancouver
VOC - BC Water	US EPA	* Volatile Organic Compounds by GCMS / Purge and Trap for Aqueous Samples, 8260/5030	Jul 24, 2023	Element Vancouver

* Reference Method Modified

References

BCELM	B.C. Environmental Laboratory Manual
EPA	Environmental Protection Agency Test Methods - US
Ext. Lab	External Laboratory
JAOAC	J. Assoc. Off. Anal. Chem.
US EPA	US Environmental Protection Agency Test Methods
USGS	U.S. Geological Survey National Water Quality Laboratory

Methodology and Notes

Bill To:	Clearbrook Waterworks District	Project ID:	RW2-63/17	Lot ID:	1666050
	2889 Grandview Crescent	Project Name:	Raw Groundwater	Control Number:	
	Abbotsford, BC, Canada	Project Location:		Date Received:	Jul 18, 2023
	V2T 2R6	LSD:		Date Reported:	Jul 31, 2023
Attn:	Accounts Payable	P.O.:		Report Number:	2895123
Sampled By:		Proj. Acct. code:			
Company:					

Please direct any inquiries regarding this report to our Client Services group.

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End of Document

